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THE

DENTAL RECORD:

A

MONTHLY JOURNAL

OF

DENTAL SCIENCE, ART, AND LITERATURE.

DEVOTED TO THE INTERESTS OF THE PROFESSION.

EDITED BY

THOMAS GADDES, L.D.S.ENG. AND EDIN.

VOL. II.

LONDON:
PUBLISHED BY
THE DENTAL MANUFACTURING COMPANY, LIMITED,
25, BROAD STREET, GOLDEN SQUARE, W.,
AND
71A, GROSVENOR STREET, MANCHESTER.

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VOL. II.

(*JANUARY TO DECEMBER,* 1882.)

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THE

DENTAL RECORD.

VOL. II. JANUARY 2, 1882. No. 1.

THE ALVEOLAR-DENTAL MEMBRANE.

By the EDITOR.

OF the four typical modes of attachment of teeth, the method of insertion in sockets, or gomphosis, attains in all extant orders of Mammalia possessing true teeth, except in some Cetaceans. This form of attachment also exists in *Crocodilia*, and with the rostral teeth of *Pristis*. On this occasion the consideration of the general subject of the attachment of teeth is confined to the limited zoological area of man, an aspect of the question which immediately concerns the dentist, and the correspondent, "STUDENT."* Though in this article there may not be stated anything that is not already known, yet, if it amount to only a reiteration of structural and physiological facts, with their bearing on certain of the more common pathological conditions, some useful purpose may be served.

The ALVEOLAR-DENTAL MEMBRANE, or Dental Periosteum, is the membrane which fixes the tooth to the walls of the socket. In structure it consists of four elements—fibrous tissues, cells, blood vessels, and nerves.

The FIBROUS TISSUE is more or less dense, tough, and of the white fibrous (connective tissue) variety. Very little yellow elastic tissue is to be found, and, those modified connective elements, fat cells, are not regarded as entering into its structure. The fibrous tissue is thicker at the neck of a tooth than it is at the deeper parts of the socket. It runs obliquely from the bone of the alveolus to the cementum of the tooth ; and, in all the longitudinal sections that I have examined, this obliquity is more pronounced in a direction from the bone towards the apex of the root. Therefore, the teeth of the lower jaw may be said to hang in their sockets, but with regard to those of the upper jaw, though the fibres pursue a similar course, the principles of gravitation preclude the use of the same simile. Numerous bundles of fibres can be distinctly traced to run from the alveolus to the cementum. At the neck of the tooth the more superficial fibres are continuous, and blend with the connective tissue of the gum; whereas the deeper fibres, or those near the bone, become continuous, and intermingle with the periosteum covering the alveolar borders. At the bone surface the fibrous tissue is arranged in something like bundles or trabeculæ, which run into the irregular pits, or open cancellæ, on the surface of the bone, as is the case with periosteum generally. The inner, or tooth, surface is less dense, being more open and reticulate.

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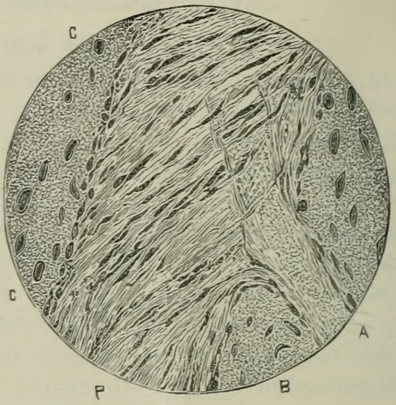
* See "Intercommunications" (7), No. 6, Vol. I.



This drawing is from the section of a human jaw and tooth *in situ*. AA shows two blood vessels, one coming from BB, the bone of alveolus, the other running obliquely across the periosteum. The direction of the fibres, with the spindle-shaped cells; the osteoblasts, close to the cementum and bone, and in the lacunæ, are clearly shown.

The CELLS vary in their distribution, size, and function. Upon the cemental surface, in the reticulate meshes of the connective tissue, the cells are more spherical and most numerous; while those in the substance of the membrane are chiefly spindle-shaped connective tissue corpuscles; those in relation with the bony alveolus somewhat spherical, granular, osteoblasts. In the case of a young tooth which is just appearing in the mouth, and retained in a large, roomy socket with a thick periosteum, these osteoblasts are actively concerned in building up the alveolar walls. But in exostosis of the cementum, and also in the eruption of the permanent teeth, there is little doubt that these osteoblasts, which at one period were engaged in the nutrition or building up of the bone, become altered in their function, and break down or absorb the osseous walls of the alveoli, so as to make room for the hyperplasia, or increase of cementum, on the one hand, or the advancing tooth on the other. Cells with this absorbing function are termed osteoclasts. They are large and poly-nucleated, and they, or processes of them, are partly lodged in the semilunar excavations of the osseous tissue, which is the seat of their destructive action. These characteristic excavations of absorption are denominated lacunæ of Howship. The aggregation of cells near the cementum, already mentioned, are, likewise, osteoblasts. By the elaboration of these masses of protoplasm, and by the connective tissue also, is the organic basis of the cementum formed. In the process of calcification many of the formative osteoblasts become obliterated, or eaten up; while numerous others, considerably reduced in size, remain, as the contents of the lacunæ. By the fibrous tissue of the periosteum forming, as just stated, part of the organic basis of the cementum, as it also does of bone, is that membrane intimately and structurally connected with the cementum or the bone, and not merely adherent to it, as is the case with a postage stamp on an envelope. Just as these osteoblasts are the active agents concerned in building up the cementum in the ordinary course of tooth development, so likewise are they the physiological elements that produce the excess of cemental tissue which constitutes dental exostosis. Dental exostosis must, therefore, be regarded as a pathological condition of periosteum, manifested in a hyperplasia of calcified cementum. As attains with regard to the osteoclastic removal of bone, so, too, can there be little doubt as to the changed function of these cemental osteoblasts in the absorption of the roots of the temporary teeth.

The BLOOD VESSELS are derived from three sources, viz.:—From the blood vessels of the contiguous bone, from those of the gum, and from those going to the pulp of the root or tooth. They are to be seen entering as small arterial trunks, and, running in various directions, break up into capillaries. Some vessels are at times to be found coursing from the bone to near the cementum, but not entering it; while others run longitudinally and obliquely. Of course, where there are arteries and capillaries there are also veins. The anatomical facts here set forth have important pathological significance. In acute inflammation of the pulp not infrequently is there to be found, co-existing with that condition, inflammation of the periosteum. Inflammation essentially depends upon an altered condition of blood vessels of the part, and with regard to a non-vascular tissue, an alteration of the blood vessels whence the tissue derives its nutriment. Now, with this alteration in structure, and consequently in function, of the blood vessels of the pulp in inflammation, there is liable to be set up by sympathy a similar condition of the branches of those vessels going to the periosteum—periostitis. In like manner, with well pronounced acute periostitis there is usually found a red ring, or inflamed margin, of gum around the tooth so affected. The gingivitis in such case is brought about by the vessels of the gum and periosteum anastomosing and sympathising.

NERVES are pretty freely distributed to the periosteum, hence the great pain in rupturing it, as in the extraction of a tooth, and also in acute periostitis. Apart from the nerves of common sensation, there are the vaso-motor nerves, plexuses of which ever accompany arteries and arterial twigs. These supply the involuntary muscular fibres in the walls of the arteries and veins, and not only regulate their size and tension, but also affect sympathy between vessels of contiguous or correlated parts.

Lymphatics have been found in the dental periosteum.

There has been a pretty widespread idea that the membrane which unites a tooth to the walls of its socket consisted of two membranes—a periosteum lining the alveolar cavity, and a peri-dental membrane covering the root of the tooth. Notwithstanding so distinguished an authority as Mr. Spence Bate, F.R.S., upholding that bi-membrane theory, the histological arrangement of the fibrous tissue and the blood vessels, which is herein set forth, and of which there is unquestionable proof, gives no support to the idea.

CASE OF ALVEOLAR ABSCESS ON RIGHT SIDE OF LOWER JAW, OPENING ON THE LEFT SIDE.

By WILLOUGHBY WEISS, L.D.S.Eng.,

Assistant Dental Surgeon to the National Dental Hospital.

G. W. (female), æt. 21.—On the 5th of August, 1881, the patient came to the National Dental Hospital, complaining of pain and with swelling under the second right lower bicuspid. The tooth was very carious, was excavated, found to be dead, and a dressing of carbolic acid inserted. The next morning, Aug. 6th, the dressing was removed and a temporary filling put in. She had not left many hours when great pain came on, and the face began to swell. She came to the hospital on Aug. 8th, the 7th being a Sunday, and had the tooth removed. Since then she had suffered even more than when the tooth was in her jaw. Tincture of opium, aconite, aconite and iodine, and hot water, were all used, but without allaying the pain. This is the history of the case previous to the patient coming under my notice.

The first time I saw the case was on Aug. 15th, and upon examination I found the alveolus, where the bicuspid had been removed, denuded of gum and exceedingly sensitive. I probed the part carefully, but failed to find any remains of a root. Behind the socket for the bicuspid was a rather large papilla of gum, corresponding to the root of the first molar, which looked as though a chronic abscess had existed for some time. She stated that the tooth had been removed some years, and that she had had a swollen face previous to its removal.

As I was examining the other part of the mouth, I discovered on the labial surface of the gum between the lateral incisor and canine on the left side a small abscess. I opened it, and passed a probe about 3-8ths of an inch into the cavity. I then tried to pass a Donaldson's nerve barb into the opening to see if I could establish a communication between this and the affected part, but failed to do so. I then sent the patient away, directing her to rinse her mouth with hot water, mixed with a little Condy's Fluid.

On Aug. 16th a small quantity of pus was squeezed out of the abscess in front of the left canine. She had had about three hours' pain during the previous day at intervals.

On Aug. 17th a larger quantity of pus was squeezed out, and she had had a little more pain.

On Aug. 18th I again saw the patient myself, and found the opening into the abscess between canine and lateral quite patent, and squeezed out a small quantity of pus. I made the opening a little larger, and passed a Donaldson's barb, but could not get it much farther than on the previous occasion. The gum, where the bicuspid was removed, looked a great deal more healthy, the alveolus was not so sensitive, and she had had about one hour's pain during the previous day. She still continued to rinse the mouth with hot water and a little Condy's Fluid.

On Aug. 20th saw the patient again; she had had about a quarter of an hour's pain on the 19th, but none since. The opening was still patent.

On Aug. 22nd had had no more pain. Where the bicuspid had been removed the part was healing up very quickly. The opening in front was smaller. She was told to return that day week and discontinue all treatment.

On Aug. 29th she stated she had been quite free from pain, the opening between the left lateral and canine being entirely closed up, and the opening where the bicuspid had been removed had also nearly healed up. She was then discharged.

I am indebted to Mr. Foster for some of the notes of this case, and also for the care and attention he has bestowed upon it when I could not attend myself.

THE CASTING OF ZINC MODELS.

By George Ward.

It is very rarely that we read any practical papers on Mechanical Dentistry, so much so, that if an unbiassed, unprofessional person were to read the Dental journals he would surely come to the conclusion that Mechanical Dentistry did not come within the scope or intelligence of the "Dental Surgeon." Perhaps he would not be far wrong.

The casting of zinc models properly is a much more important matter than most Dental practitioners imagine, and, oftener than otherwise, very improperly done; therefore, it will not be out of place to give a few practical hints thereon. Now, the form of the plaster model is of great consequence, for it should be so formed and shaped as to easily assist in casting the zinc. First, all plaster models should have no superfluous bulk, that is, if any molars or teeth are not to be utilised for the artificial denture; then such should always be cut away, and the plaster model trimmed to as small proportions as is consistent with the case to be made. Also, on no account should the base be too broad, or the depth of model too great, as both are wanted in the zinc casts and not in the plaster ones. In fact, let all plaster models be small, otherwise huge unwieldy zinc casts are formed; whereas, for all practical purposes, strength and density are needed in the zinc, and not the plaster casts. The truth is, if zinc casts are formed on true mechanical principles, they will not only greatly aid the operator in striking up a plate, but, what is more, never split or crack across the palate. How this is to be arrived at from small, neat plaster models shall be my endeavour to show.

Having cut the plaster model to its smallest required proportions, the depth never to exceed two inches, if that,—and having sterined it, and prepared the casting sand, which should always be sifted before damping—place the plaster model in the centre of a casting ring, and ram well home the sand on sides and top, and withdraw in the usual way. If the sand casting is true, proceed to pour in the melted zinc. Now, as soon as the fluid zinc reaches the level of sand, place on it a hollow cone of gun-metal, with a top no larger than the face of the swaging hammer, and with a base in proportion. The best practical size of the cone is as follows:—Diameter of base, $3\frac{5}{8}$ in.; across, $2\frac{5}{8}$ in.; top, 2 in.; across, $1\frac{1}{2}$ in.; and depth of cone, $1\frac{3}{4}$ in. The cones which the writer has in use he had cast from patterns made by himself. They must not be round, but the shape of plaster model. Well, as stated, as soon as the melted zinc reaches the level of the sand cast, on it place one of these cones, see that it is fairly in the centre of cast, and then through the top pour in the rest of the melted zinc until the cone is full. But, before doing this, care should be taken to back up the edges of the base of cone with damp sand, and to hold it firmly in its position, or the fluid zinc will raise the cone, and the metal overflow. The entire process takes not near so long to do as to describe in writing. After letting the cast cool dig it out, and the gun-metal cone will readily come away of itself, leaving as fine, strong, and dense a zinc cast as it is possible to form, and which no amount of hammering will ever split or crack. It need scarcely be explained to a truly scientific Dental mechanician that the denser and heavier the zinc casts are the more effectually the blows of the hammer will tell on the plate to be struck up. Not only this, but the now solid cone-shaped head of the zinc cast will receive the blows of the hammer on the self-same spot—a matter of great importance in striking up plates, and which should be never lost sight of.

Now, as to the counter cast, it should always be of pure tin, and formed thus:—Place the zinc cast on its cone end in the centre of a strong, block tin, casting ring, much higher than those for casting zinc casts in; steady the zinc model with sand, dash French chalk on the face of it, throw on more sand, ram it home firmly, and pound with a mallet. Smooth the top of sand, and cut away until the face of the zinc casts is laid bare in all the parts wanted for the plate to be struck. About half an inch, more or less, of the sand must be left between the cuttings and the rim of casting ring. The sand also must never be cut away from the *fronts* of zinc teeth. If there are any narrow-necked canines, the less they are bared of sand in front the better. Also, only half bare the fronts of molars wanted for bands. When the entire zinc cast is bare of sand as wanted pour on it the melted tin until the fluid metal reaches the level of sand. In a very few minutes it will cool, and a flat-bottomed countercast formed, which will be found not only better to strike on than the old form of immersing the zinc casts in a ladle of melted tin, but it will very easily cause the plate to be released without any danger of bending. There is no hesitation in writing it that the old plan of dipping the zinc cast in a ladle of melted lead or tin is the lazy dentist's resort. In very large thick plates it is always necessary to procure a corrector in lead, in the same manner as I have described the tin countercast to be done. These tin or lead counter models should always be from 2 to 2½ inches deep in metal, as light metal casts will invariably spring plates.

Lastly, in striking up a plate, and after it is somewhat adjusted, let but a few weak blows fall on the dies while resting on an anvil. Then, if a plate is found to be going correctly, hold the two metal casts, with the plate between them, in the flat of one hand with the arm resting on the thigh, and let the blows fall freely on the flat base of counter cast. The mechanical reason for this is, that, if the metal casts are placed on an anvil the entire force of the blows goes into the anvil and not on to the plate, while it will spring the latter. Whereas, the plan of giving the heaviest blows while holding the metal casts in the hands enables the plates to be got up much sharper and truer. On the other hand, when a lead corrector is used, place the metal casts on an anvil—counter model downwards,—and give a few steady blows on the cone-shaped head of the zinc casts. The entire plan here recommended will be found much superior to any in use, and to be the acme of metal castings from the plaster models for striking plates on.

THE ORAL SECRETIONS.

A Paper read before the Students' Society of the National Dental Hospital and College,

BY W. T. ELLIOTT.

SINCE it is only by a discussion of principles that we can arrive at the methods of Nature and rightly estimate her laws, so, in the study of any subject, we may always arrive at the most satisfactory conclusions by tracing phenomena through all their stages. In like manner, if we reflect upon the influences which cause the formation of the oral secretions, are we better able to determine their functions and value in the animal existence; and it is only by such means that we shall be able to understand the intricate concatenations and changes which we constantly find.

Animal life itself is the expression of the metamorphoses of the tissues of the being; every act of life is attended by a consumption of matter—it signifies something changed or destroyed. The vital force partakes in its component parts of the same characters as chemical force, inasmuch as it only acts when the particles are at infinitely short distances from each other. So it may be simply a "condition of matter," or a "circulation of matter," as is gravity, electricity, magnetism, chemical activity. Life is maintained also in and by the result of chemical changes incessantly occurring; if they have an inherent, determined direction, it is health; but when declensions arise, the processes are morbid, and result in disease. Mr. Simon has expressed this well by describing pathological results as the "morbid declensions" from the "normal chemical standards" of physiology. The laws of inorganic nature have been found to possess an influence over these processes, as far as investigations have gone; thus leaving us to assume that the forces of the living are the same as those of inanimate bodies, and that they obey the same laws; and that it may eventually be possible to explain their phenomena by these laws. We know that no element has yet been found in any living body which does not also exist in inorganic matter: therefore the chemical phenomena in the animal body resemble, so far as they are understood, those artificially produced out of the body.

Secretion is the preparation and separation of any substance from the economy, and the substance may either pre-exist in the blood, or be elaborated from it. In the perspiration there is little which does not exist in the blood; but in the bile its constituents would be poisonous with it.

Secretion in salivary glands is accompanied by a manifestation of energy, by an evolution of heat; and it is probable that the chemical processes are those of oxidation. The impulse of the chemical changes in these transuded fluids is supposed to be in the cells undergoing (under nervous stimulation) a change of condition, during which they have powers of attraction, elaboration, and transmission of substance.

Termination of nerves may be traced into direct connection with the protoplasm of cells, and even their nuclei. In the sub-maxillary gland cells in the rabbit and ox branches of nerve have been traced to individual corpuscles, and it has been found that stimulation of the chorda tympani excites secretion, and that these corpuscles so excited have a different appearance from those of a gland which has been at rest. We also know that the secreting cells of the glands of the stomach have a different appearance during digestion and after digestion. The influence of the nervous system on this secretion has been carefully investigated by Claude Bernard, tending to show that in every act of secretion there is probably a nervous influence at work, and this may be evidenced by the quantitative and qualitative alteration of products (*vide* analyses). But the nervous system may also influence secretion by its action on the circulation, which, leading to dilatation or narrowing of the arteries, may cause—

1. Change of pressure in gland capillaries, and therefore filtration or osmotic changes, consequently some constituents may pass through which do not at other times.
2. Changes in the chemical processes dependent on the greater or lesser quantity of oxygen brought to the gland.

The active condition of gland cells is not in all instances occasional; the action of kidneys and skin never wholly cease in health, and the corpuscles here have some amount of continuous activity comparable with "tonicity" in muscles, and I myself believe that, since the flow of saliva is not arrested during sleep, some such condition likewise exists in these cells.

The following facts demonstrate the power of nervous action over the secretion:—

The contact of solid substances with mucous membrane excites the flow: hence dryness of mouth may be remedied for a time by taking a pebble into the mouth: the idea of savoury food, and food introduced directly into the stomach.

The glands concerned in secreting the oral fluids are:—the parotids, submaxillaries, sublinguals, labial, buccal, and palatine; also the follicular glands of the tongue and mucous surface, to which may be added the tonsils. Gray describes them as organs in which the blood, circulating in capillary vessels, is brought in contact with epithelial cells by a mucous membrane, whereby certain elements are separated from the blood. The relative size of these glands in different animals is dependant upon their food and conditions of life, and it is more varied than is generally supposed.

General Characters.—Normal mixed saliva is rather turbid, opalescent or faintly bluish white; somewhat viscid, and capable of being drawn out into threads, and is devoid of odour and of taste; after standing, it deposits a greyish white sediment consisting chiefly of pavement epithelium.

The natural state of mucus is acid, and saliva is alkaline.

According to Mr. Salter the mucus of the mouth is alkaline, and the saliva becomes acid after prolonged speaking. The alkalinity of saliva is generally in direct ratio of muscular effort in mastication—hence grooms relieve heartburn by chewing beans.

The average amount secreted in man is from two to three pints in twenty-four hours (Kirke).

The specific gravity in 200 experiments by Wright was found to be—1·0089 the highest, and 1·0069 the lowest. When above 1·0100, or below 1·0030, it may be considered morbid.

Wright found the specific gravity of the saliva of healthy men who lived on—Mixed diet, 1·0079 to 1·0085; Animal diet, 1·0098 to 1·0176; Vegetable diet, 1·0039 to 1·0047.

Parotid Saliva (human) is very fluid, limpid, and as clear as water. It is less alkaline than submaxillary saliva, and it is doubtful if it contain ptyalin.

The following analyses of human Parotid Saliva are given by Dalton and Kingzett:—

	Dalton.	Kingzett.
Water	983·308	995.3
Organic matter precip. by alcohol (ptyalin, mucus, &c.)	7·352	1·4
Substances destructible by heat, but not precip. by alcohol or acids (probably album'ns. matter, and debris)	4·810	
Sulphocyanide of soda (or potash)	0·330	
Phosphate lime	0·240	
Carbonate calcium		1·2
Chloride potassium	0·900	
Other mineral matters		2·1
Chloride of soda and carbonate of soda	3·060	
	1000·000	1000·0

Submaxillary Saliva.—In dogs the submaxillary saliva is, according to Bernard, devoid of morphological elements.

The specific gravity (human) 1·0041 (Jacubowitsch).

Two analyses are given in the following table :—

			Bidder and Schmidt.	
			1	2
Water			991.45	996·04
Organic Matter			2·89	1·51
Inorganic Matter	Calc. Chlor. Sod. Chlor.	4·50		
	Carb. Lime Phosp. Lime Phosp. Mag.	1·16	5·66	2·45
			1000·00	1000.00

Sublingual Saliva.—This contains morphological elements (salivary bodies) resembling closely mucous corpuscles; these "salivary cells" enclose granules which exhibit active molecular movement (Donders). It is extremely viscid from the quantity of mucus it contains; but I have not been able to find an analysis of the fluid.

There are four kinds of saliva secreted by the submaxillary glands, according to the irritation of each of the several nerves supplying the glands. These are :—

Chordal Saliva.—Secreted by sub-maxillary glands on irritation of chorda tympani. The following analysis is given by Thudichum :—

Solids 4°/o { =1·5 globulin, mucin and coagulable albumen.
=2·5 mainly alkaline chlorides and lime salts.

Sympathetic Saliva.—On irritation of the sympathetic nerve there flows a secretion, opaque and tough in character; it has much free alkali, and from 15 to 28 parts per 1000 of solids.

Ganglionic Saliva flows when the sub-maxillary ganglion is made the centre of a reflex action, working by way of the lingual nerve.

Paralytic Saliva is very thin, and contains little solid matter; it is secreted under the influence of nervous paralysis, which may be caused by degeneration of nerve centre, or by poisoning, or by lesions affecting the secretory nerves.

The Constituents of saliva may now severally be considered :—

Mixed Saliva.

	Berzelius.	Frerichs.	Jacubowitsch, also Bidder and Schmidt.
Water	992·9	994·10	995·16
Solid Matters	7·1	5·90	4·84
Ptyalin	2·9	1·42	1·34
Mucine	1·4	2·13	1·62
Sulphocyanide Potash	-	0·10	0·06
Salts	1·9	2·19	1·82

MIXED SALIVA (Wright).

Water	988·10
Ptyalin	1·80
Fatty Acid	0·50
Chlorides, Potash and Soda	1·40
Albumen with Soda	0·90
Phosphate Lime	0·60
Albumenate of Soda	0·80
Lactates of Potash and Soda	0·70
Sulphocyanide of Potash	0·90
Soda	0·50
Mucus with Ptyalin	2·60
Loss	1·20
	1000·00

Water.—It must be remembered that the large amount of water present in this secretion is at no one time entirely removed from the blood; but it is reabsorbed nearly as fast as secreted, and that, normally,* none of it is discharged from the body.

Ptyalin.—The composition of this substance is unknown. According to Cohnheim it is not albuminous. It constitutes about one-third of the solid constituents, and may be isolated in a measure by precipitating fresh saliva with phosphate of lime. In this way it is carried down in a mechanical manner with calcic phosphate, and may be extracted by water. From the aqueous solution it is precipitated by alcohol, and, by frequently repeating the solution and *re*-precipitating by alcohol, it is obtained in a snow-white form. Its solution does not coagulate on heating, but its fermentive power is destroyed at 60°, and is also destroyed by strong acids and alkalies. According to Mialhe its energy is such that one part is sufficient to transform more than 2000 parts of starch into glucose. A given quantity cannot convert an indefinite amount of starch into sugar (Parchantier).

Mucus—Mucin.—Albuminoid body. The following is the mean of three analyses by Scherer:—

Carbon	52·1
Hydrogen	6·97
Nitrogen	12·82
Oxygen	28·11
	100·00

It is very nearly of the same composition as gelatine, but contains no sulphur like that body.

It may be prepared by dilution with water; precipitating with alcohol and boiling in alcohol and ether repeatedly. This is very difficult to analyse and obtain, because of the small quantity secreted and of getting it in a normal condition, in consequence of the mucous membrane being easily diseased.

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* In excessive spitting the mouth becomes converted into a urinary aqueduct, and *that* fluid is diminished.

The fluid from the sublingual glands possess most; that from the sub-maxillary glands is next; while the parotid secretion contains least.

Potassium Sulphocyanide.—Found principally when Dental caries is present (Hermann). It is peculiar to man—is detected by the red colour given by ferric chloride. It increases under treatment involving consumption of sulphur. Salter says it does not exist in the separate secretions, but is the result of some decomposition after their union. In mercurial salivation it usually disappears when mercury appears.

Enderlin says the alkalinity of saliva, like that of blood, is due to a tribasic phosphate of soda.

It is impossible to devise at present a perfectly reliable scheme of analysis. The great thing to ascertain is how much of each constituent is contained under various conditions; for if there were twenty analyses of saliva no two would be exactly alike. From this we see that the secretions vary so much, at different times, in different persons, and in different classes of animals, that no single standard can be adopted. So long, therefore, as the proportions do not materially differ, and no morbid principle be found, these numerical deviations, we may believe, are not of primary importance.

Either of the following two methods of analyses may be adopted:—

A MODE OF PROCEDURE FOR THE ANALYSIS OF SALIVA.

1. Evaporate a measured quantity to dryness in a previously tared dish at 100^c. Weigh residue.—Loss is water.
    (a) Incinerate residue carefully and weigh the ash—the loss is organic matter.
    (b) Analyse the ash by applying the usual tests for calcium, magnesium, potassium, sodium, chlorine, sulphuric acid, nitric acid, and phosphoric acid, and determine the proportions of each.
2. Take a measured quantity of the same saliva, dilute with four or five times its volume of water, and filter through a previously *weighed* and *dried* paper; wash the insoluble matter on filter; dry at 100^c, and the increase of weight upon the filter will give the *mucin.*
    (a) Boil the filtrate, and collect any matter which may coagulate; repeat the operation after acidifying with acetic acid, and collect precipitate; repeat the operation with dilute nitric acid, and collect any further precipitate. These will give the relative quantities of albuminous matter present.
3. Concentrate a measured quantity of saliva, and divide into several parts.
    (a) Estimate carbonates by acidifying with HCl, by gently warming and collecting the CO_2 evolved. Test the purity of CO_2.
    (b) Estimate ptyalin by phosphate precipitation method.
    (c) Estimate sulphocyanides.
4. Determine fats by the saponification and ammonia process.

ANOTHER METHOD OF PROCEDURE.

Saliva,—*Filter.	Solid Residue.	1 Exhaust with ether and evaporate	1 Exhaust with water and evaporate	Ptyalin.	
			2 Dissolve in ether and evaporate	Fatty Acid.	
		2 Exhaust with water and evaporate		Chlorides of soda and potash.†	
		3 Incinerate residue	Loss	Albumen.	
			Ash	Soda (carbonate) Phosphate lime	Treat with water which dissolves out the soda.
	Filtered Liquid.	1 Concentr. liquid $\frac{1}{3}$, pass galvanic current through		Albuminate of soda is deposited.	
		2 Residue evaporated and dried	1 Exhaust with ether and evaporate	Lactates (potash and soda) Sulphocyanides (Potash)	Treat with water and add lead acetate, the sulphocyanide are precipitated.
			2 Exhaust with alcohol and evaporate	= Chlorides of potash and soda.	
			3 Neutralize residue with acetic acid, dissolve in alcohol and evaporate	Soda.	
			4 Incinerate residue	Loss = Mucus Ash = Phosphate soda Sulphate soda Phosphate lime‡	Treat with boiling water to separate lime salts from soda.

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* Filtration *must* be complete before exhausting with ether, because ptyalin, and lactates, and sulphocyanides are all soluble in ether; but still ptyalin being *less* soluble in water than the lactates and sulphocyanides, *may* be separated by concentrating the solution of the above salts, if its presence be suspected.

† Possibly only a ertain amount of these salts can be held in solution.

‡ This salt dissolves in the presence of albumen.

THE FUNCTIONS of saliva are passive, mechanical, and chemical.

1. *Passive* (*a*) It assists sense of taste; (*b*) it favours expression of voice; (*c*) it clears mucous membrane of mouth, and moderates thirst.

2. *Mechanical.*—It serves to dissolve sapid substances and render them capable of exciting nerves of taste—ex: quinine undissolved is tasteless. The slimy nature of mucus fits it for the purpose of lessening friction, and in animals for taking up food, as in the ant-eater. We know that the rapid deglutition of very dry food is impossible, and when the process of mastication and insalivation is completed and the food passed back into pharynx, it meets with the secretion of the tonsils and pharyngeal glands, which further coats the surface of the bolus with viscid fluid. The secretions from sub-maxillary and sublingual glands, and of the small glands and follicles of the mouth being more viscid and less in quantity than the parotid secretion, penetrate the bolus less easily, and have a tendency to form a glairy coating on the external surface of the mass.

The amount of saliva mixed with the food bears a direct proportion to its dryness. White bread absorbs in the mouth 55 per cent., and cooked meat 48 per cent. of its original weight.

It has a tendency to convey air-bubbles into the stomach, and some state that this is necessary for digestion; we know that heavy bread, for instance, is not easily acted upon by the gastric juice.

The quantity of gas in 100 parts of saliva of dog McKendrick found to be:—

CO_2	74·93
N	0·92
O	0·65
Per centum	76·50

Chemical.—Proteids or albuminoids are the most complex combinations of carbon, hydrogen, oxygen, and nitrogen, and, as they are found in nature, contain also potassium, sulphur, sodium, &c. Ptyalin converts starch into grape sugar, provided the solution be alkaline; though Hermann asserts this change is not prevented by the presence of a moderate amount of acid. Another authority states that mixed saliva acts upon starch, whether acid or alkaline, at equal temperatures with equal energy.

So powerful is the action of ptyalin that a notable amount of starch, taken as food, is converted into dextrine or sugar before being swallowed. It is converted into dextrine and glucose by the absorption of water, as:—

$$C_{18}H_{30}O_{15} + H_2O = \underset{\text{(Glucose)}}{C_6H_{12}O_6} + 2\,\underset{\text{(Dextrine)}}{C_6H_{10}O_5}$$

The greater heat of the stomach over that of the mouth converts all the starch into sugar, for if it is boiled we find that the sole ultimate product is glucose.

Starch, N ($C_6 H_{10} O_5$, probably $C_{18} H_{30} O_{15}$) is the only substance upon which saliva acts chemically. It has no influence on any of the other ternary substances, and is destitute of power over albuminous and gelatinous substances.

In the lower animals the three kinds of saliva do not possess an equal power of converting starch into sugar, as in man (Hermann). In the dog and other carnivora, amylaceous substances are unchanged in the mouth.

That this fluid is necessary for digestion is proven by its effects on the general function of nutrition when diminished in quantity, and in those animals which do not masticate there is a prolonged stomach digestion, as in snakes, carnivora, &c.

From the foregoing it is evident that a difference exists in the properties of the oral fluids in different animals, as well as in the teeth and jaws, corresponding with differences in character and condition of alimentation.

A natural and regular mode of living will induce a healthy state of the salivary fluid. The irregular ways of living produce at one time an excessive flow of fluid, and consequently a great increase of temperature, and then (the glands being overworked) there must necessarily be some marked cessation of flow; stagnation ensues, and thus, obeying one of the laws of nature, leads to a "change." Its normal action attains when the changes of the elements goes on slowly and regularly, so that the element of each base or acid may be combined as fast as liberated and so taken up, not allowing time to manifest either acid or alkaline reactions.

Food produces a difference in the gravity of this fluid, and alters the force of the electric condition passing between the teeth and substances around them.

What can we really do in the preventive treatment of Dental diseases? A knowledge of the habits and constitutions of our patients, and an intimate acquaintance with the proper conditions and compositions of the oral fluids is necessary before we can practise this treatment. The method to be pursued is plain—the result important. Given a line of inductive reasoning based upon experimental data, and it must lead us surely to some advantage. A constant production of new theories is necessary for the progress of Science—the growth of which can be effected only by a gradual assimilation of crude matter with a ceaseless displacement of reconstruction. Therefore let us keep to these investigations, as the peculiar province of ourselves, as students of Dentistry: for the proportion in which we multiply our means of accurate observation is directly indicative of our distance from empiricism.

BONWILL'S METHOD OF RESTORING CROWNS UPON ROOTS.

By Dr. E. A. Stebbins, Shelburne Falls, Mass.

In a paper, offering some remarks upon this subject, which was read before the Connecticut Valley Dental Association, and published in *Johnston's Dental Miscellany*, Dr. Stebbins says :—

After having settled the preliminaries, my manner of procedure is to perfectly cleanse the pulp canal and fill it from the apex down about half the length with cement or Hill's stopping; when ready to adjust the crown, put on the rubber dam (except in some cases where the root has decayed away too far up); remove the natural crown with engine burs so far up that when the gum is allowed to resume its natural position it will cover the joint between the root and crown; grind the porcelain crown to conform to the root, and a little shorter than will appear when done, to allow for the amalgam between it and the root; enlarge the pulp canal sufficiently to allow for filling around the bar or pin (cutting grooves around for retainers); take a round platinum wire as large as admissible for the hole through the crown to be used, hammer it into a square bar, make a little head on the end, barb the corners, by trial ascertain the length required, cut off accordingly and prepare the other end the same as the one already described if for a molar or bicuspid, but if for a cuspid or incisor flatten the end a little and barb the corners; then put bar and crown in place to see that all has been properly done; hold the bar in place in the root and fill around with amalgam as hard as can well be perfectly impacted; place around the bar and cover the base of the root with amalgam sufficiently soft to be compacted with the crown; put on the crown, and with pressure and a mallet force it up into place (taking care that there is enough and not too much amalgam); remove all surplus mercury and amalgam that may be seen; hold the crown firmly in place and fill the opening around the end of the bar with amalgam as hard as can be well worked.

When all is completed hold the crown firmly in place while pulling off the dam, and be sure the crown is kept perfectly in place till the amalgam his hard enough to retain its position. After a few days or hours the amalgam that is exposed, or that comes in contact with the gum, may be smoothly finished.

I have not seen, nor can I conceive of a case where any other course is justifiable than to fill the canal to the apex. A tap-hole is not only useless but likely to be of positive injury. The removal of the pulp and health of the periosteum should be attended to previous to the time of putting on the crown. The dam is useful, not only in keeping the operation dry but in protecting the gum and holding it away from the root. With a ligature around the root below the rubber the gum may be pressed and held up out of the way by a firm and steady pull. Where the crown is broken all off, the rubber may be adjusted by use of a clamp. Care is required in burring off the end of the root, in revolving the bur from, instead of toward, the periphery. A fissure bur works very nicely for this purpose. It is better that the amalgam cover the entire end of the root rather than have the crown touch it at any point.

Hammering the wire into a square bar renders it a little stiffer, and it will be stronger than a three-corned pin. A head on the end in the root makes it a little more secure than a tapering pin is. The head on the end in the bicuspid or molar crown should come down through, even with the grinding surface. The end in the cuspid or incisor should be flattened to correspond with the shape of the hole in the crown, and come down to the lower end of it. Pulling off the rubber has a tendency to smooth off the amalgam in the joint. Cut off no more crowns at once than can be replaced at the same sitting.

For bicuspids with two roots a large wire flattened at one end and split as far as required to go into the roots, or two small wires, may be used. For a bicuspid with one root the wire may be bent in the root a little. As the molar crowns have two holes they can be set very firmly.

AMALGAMS.

OPINION is still divided, says the *English Mechanic*, with regard to the nature of amalgams, some considering them to be isomorphous mechanical mixtures, others, true chemical compounds. The former view derives support from those cases in which amalgamation is associated with an absorption of heat, as in the solution of a salt or in dilution of a solution; the latter is supported by the fact that many amalgams are formed with a strong development of heat. A contribution to the subject has been lately made by Herren Merz and Weith, in the Berlin Chemical Society. These chemists have investigated whether, with regular heating, amalgams part with their mercury continuously or in distinct gradations.

The experiments consisted in placing the amalgam in a porcelain dish within a glass tube, contracted below, and enclosed in a second tube, having a bulb at its lower end. This bulb of the outer tube contained the substance of the vapour bath (sulphur, mercury, or diphenylamine). To guard the amalgam from air, a lively current of an indifferent gas was passed through the interior tube while the experiment lasted. The amalgams used, which were always directly produced by known methods, contained on an average 60 to 80 per cent. of mercury. This heating was continued, wherever possible, until after several hours no decrease of weight (or hardly any) was perceptible. There were examined gold, silver, copper, lead, tin, bismuth, zinc, cadmium, sodium, and potassium amalgams. The results for the first eight are very briefly communicated, those for the last two, whose easy oxidability required special precautions, more fully. In the case of these alkali amalgams, the authors also sought to determine the melting points, but, for certain reasons, very accurate results were not reached. In general, the melting points of the amalgams rise at first very quickly with the proportion of alkali-metal, then gradually fall. It was thus observed, that when mercury is heated under paraffin to 250°, and them some sodium is added in portions, the whole mass solidifies with 4 to 5 per cent. of sodium; but with further addition of some percentages the mass fuses completely.

The results of their investigation are summed up by the authors as follows:—A survey of the results described shows, for a series of amalgams, that even with moderate heating they do not furnish determinate compounds.

The amalgams of gold, silver, copper, bismuth, lead, tin, zinc, and cadmium lose their mercury entirely, or nearly so, even at or under the boiling temperature of mercury. Where no mercury remained, the cause is to be sought rather in a mechanical exclusion, than in a chemical action. But, on the other hand, the easy decomposability of these amalgams evidently offers no proof that there are no chemical compounds in them.

For the rest, if we consider the great variability of amalgams, together with the fact that, in squeezing the so-called mercury solutions of metals these latter do not remain behind, but contain mercury compounds, the view acquires the greatest probability, that at least very many amalgams may be, indeed, molecular combinations, but in fixed relations.

Most pronounced does chemism appear to be in the amalgams of potassium and sodium. They lose their mercury extremely slowly, even at the boiling-point of sulphur, as also in a gas current, and so in circumstances highly favourable to removal of mere mixed substances. The remarkable relations, too, as regards the melting-point, seem to speak for the presence of true chemical compounds. Probably these amalgams, at a comparatively low, as well as at a high temperature, consist of different compounds, none of which, however, have a durable existence, and therefore recurrent, fixed relations of composition are not to be met with. Alkali-metal amalgams of fixed composition would probably be obtained on production of larger quantities of amalgam; perhaps also by heating considerably above the boiling temperature of mercury.

DENTISTS FOR ARMY AND NAVY.

AN OLD PROPOSITION FOR THEIR APPOINTMENT TO BE RENEWED IN CONGRESS.

About the year 1850, says the *New York Times*, the subject of appointing dentists in the Army and Navy was first brought forward in this country. About this date the question was also agitated in France and England, but in America only the matter has been given the prominence and character to which those interested claim it is entitled. It was not until 1861 that the American Dental Convention appointed a committee to urge the Government to take the matter under consideration. In 1868 a bill calling for the appointment of dentists in both branches of the national service was laid before Congress by Senator Hamlin, of Maine. This was, in reality, the first effort of consequence made ; but despite a strong exertion on the part of the advocates of the reform to get the bill through, it was referred to the Committee on Military and Naval Affairs, from whom it received only passing notice. During the Forty-second Congress a second bill was presented by the Hon. De Witt Townsend, advocating dental appointments to the Military and Naval Academies, but, as in the previous instance, it was passed over to the committee, who gave it little or no consideration. A dentist has been appointed to the Naval Academy at Annapolis, with the rank of Assistant Surgeon, and this is really the only movement the Government has made favourable to appointments of the character referred to. President Lincoln favoured the movement, and many dentists of standing and eminent physicians consider it worthy of their support. The most zealous workers in the cause are, perhaps, Drs. Edward Maynard, of Washington ; J. D. White, of Philadelphia ; J. H. M'Kellops, of St Louis ; W. H. Atkinson, A. P. Merrill, and George H. Perine, of New York. The latter, in a conversation with the writer upon the subject, said :—"Dental chairs have been established in most of the State medical colleges, and the acknowledgment of dentistry as a speciality of medicine is general. Dentistry is a science, not a mere mechanical trade, and men of ability and experience have devoted themselves to the production of text-books, without which no medical library would be complete. Much of the opposition we have had to contend with in our efforts to have dentistry accepted as one of the medical requirements of Army and Navy practice, has had its origin in the fear that its introduction would necessitate the displacement of present incumbents or the increase of expense through the establishment of a dental bureau. A bureau would be unnecessary, nor would there be any increase of expense to the Government for the reason that it is not proposed to appoint men for the practice of dentistry only, but to select, when vacancies occur or additional appointments are found necessary, candidates from the ranks of those who have graduated from colleges where dental surgery constitutes a part of the regular course."

Lieut. H. Whiting, of the United States Marine Corps, expressed himself as follows regarding the subject :—" I consider the appointment of surgeons who possess a thorough knowledge of dentistry a necessity, and I believe the Government should and will before long take decided steps toward that end. Nowhere is the want of dental treatment experienced more than on board training ships and sea-going vessels—particularly at foreign stations—and in most cases the only remedy resorted to for an aching tooth is the forceps; hence many valuable teeth are sacrificed in the absence of proper dental treatment, and other and more serious disorders often follow. From men now in my command who have served in the Army I have learned that the same state of affairs exists at the military posts in the far West. I am fully convinced that much suffering is experienced by soldiers and sailors from the lack of proper treatment of diseases of the teeth. Sound teeth constitute one of the physical requirements of men entering the service, and it is but right that the Government should bestow upon its servants the care necessary to protect their health. Neither soldiers nor sailors can afford, from their limited remuneration, to pay for dental treatment, and it is unjust that a man entering the service with sound teeth should lose them for want of proper care during the term of his enlistment."

Lieut.-Commander Heyerman, executive officer of the receiving ship Colorado, said to the writer :—" I am decidedly in favour of the appointment of surgeons in the Navy who possess a knowledge of dentistry. The care of the teeth of sailors is a matter worthy of consideration, and I am greatly in favour of the movement."

Post Surgeon Major Janeway, at present stationed at Governor's Island, stated that he had experienced the necessity of dental services in the Army, and that he had endeavoured to supply the deficiency at all times so far as was in his power. Dr. Frank H. Hamilton was one of the signers of the second petition presented to Congress appealing to that body for the enactment of a bill authorising Army and Navy dental appointments, and he expresses himself in favour of appointments of the character above alluded to.

In 1858, the chief of the medical staff of the French Army, Baron Larrey, issued an order calling the attention of officers to the condition of the teeth of soldiers, and suggesting that something should be done to preserve them from decay and loss; and about the same period General Sir De Lacy Evans endeavoured to interest the British Government in the same subject, and at his instigation a circular was distributed among regimental surgeons reminding them of the value of soldiers' teeth. As they were not supplied with the requisite instruments, and in most cases had little or no knowledge of dentistry, the effort was attended with but slight beneficial results. At the International Medical Congress, held in London last August, Thomas Gaddes, L.D.S. Eng. and Edin., read a paper on "Dental Surgery in the Army," in which he referred to the union of dentistry with medicine, and endeavoured to impress his auditors with the importance of the establishment of dental surgery as one of the requirements of the Army Medical Department. It is understood that the same subject is to be brought before the American Medical Association at its next annual session in May, and an effort will be made to induce the authorities at Washington to give the subject consideration.

ON THE EVOLUTION OF ANTLERS IN THE RUMINANTS.

By W. Boyd Dawkins.

Considering the relation which exists among ruminants between the presence of upper canines and the absence of horns, and *vice versâ*, and the related sexual significance of those dental and frontal appendages, the following article from *Nature* is not without interest to the student:—

The development of antlers in the Ruminants, to which Sir John Lubbock alluded in his address to the British Association at York, confirms the truth of the doctrine of evolution in so clear a way that it is well worthy of being laid before the readers of *Nature*, although I have already brought it in part before the Geological Society, in 1877 (*Quart. Journ. Geol. Soc.* xxxiv. 419), and published it in outline three years later, in my work on "Early Man in Britain, and His Place in the Tertiary Period." The results of an inquiry to which I was led by a systematic study, extending over several years, of the more important collections of fossil mammalia in Britain, France, and Italy, may be summed up as follows:—

In the middle stage of the Meiocene the cervine antler consists merely of a simple forked crown (*Cervus dicroceros*), which increases in size in the Upper Meiocene, although it still remains small and erect, like that of the roe. In *Cervus Matheroni* it measures 11·4 inches, and throws off not more than four tynes, all small.

The deer living in Auvergne in the succeeding or Pleiocene age present us with another stage in the history of antler development. There for the first time we see antlers of the axis and Rusa type larger and longer and more branching than any antlers were before, and possessing three or more well-developed tynes.

Deer of this type abounded in Pleiocene Europe, and I have examined their remains from the Red Crag of Norwich and Suffolk, from various localities in Middle and Southern France, from Italy, and even from the little Island of Capri. They belong to the Oriental division of the Cervidæ, and their presence in Europe confirms the evidence of the flora brought forward by the Count de Saporta, that the Pleiocene climate of Middle Europe was warm. They have probably disappeared from Europe in consequenee of the lowering of the temperature in the Pleistocene age, while their descendants have found a congenial home in the warmer regions of Eastern Asia.

In the latest stage of the Pleiocene—the Upper Pleiocene of the Val d'Arno—the *Cervus dicroceros* of Nesti presents us with antlers much smaller than those of the Irish elk, but so complicated as almost to defy description. This animal survived into the succeeding age, and is found in the pre-glacial forest bed of Norfolk, being described by Dr. Falconer under the name of Sedgwick's Deer (*C. Sedgwickii.*)

The Irish elk, moose, stag, reindeer, and fallow deer appear in Europe in the Pleistocene age, all with highly complicated antlers in the adult, and the first possessing the largest antlers as yet known. Of these the Irish elk disappeared in the Prehistoric age after having lived in countless herds in Ireland, while the rest have lived on into our own times in Euro-Asia, and, with the exception of the last, also in North America.

From this survey it is obvious that the cervine antlers have increased in size and complexity from the Mid-Meiocene to the Pleiostocene age, and that their successive changes are analagous to those which are observed in the development of antlers in the living deer, which begin with a simple point and increase in number of tynes till their limit of growth be reached. In other words, the development of antlers indicated at successive and widely separated pages of the geological record is the same as that observed in the history of a single living species. It is also obvious that the progressive diminution of size and complexity in the antlers from the present time back into the early Tertiary age shows that we are approaching the zero of antler-development in the Mid-Meiocene age. I have been unable to meet with a trace of any antler-bearing ruminant in the Lower Meiocenes either of Europe or of the United States.

Nor are we left without direct evidence on this point. The discoveries in the Mid-Meiocene shale of Sansan in the South of France, published by Prof. Ed. Lartet in 1839 and 1851, and those made in New Mexico, Colorado, and Nebraska, and published by Prof. Cope in 1874—1877, present us with a series of antlers in which the burr is conspicuous by its absence. Still more recently, in 1878, similar specimens (***Procervulus***) have been described by Prof. Gaudry ("Les

Enchainements," p. 87) from the Mid-Meiocene strata of Thenay in the valley of the Loire. In all these cases the bony prolongation of the frontals—for antler it can hardly be termed—is small, erect, and variously branched, is persistent through life, and probably, as Prof. Cope suggests, was covered, as in the giraffe, and on young growing antlers, with skin.

In some, however, of Prof. Cope's specimens a well-marked burr is to be seen on some of the tynes (The United States Geogr. Survey, Part II. vol. iv. Palæontology, Pl. lxxx., *3b*, *4a*), due, perhaps, to an accidental stripping of the velvet, and consequent inflammation, resulting in the death of the bony tissue above it. We may therefore conclude that this singular *Procervulus* type was the starting-point of the antlered Ruminants both in the Old and the New Worlds. In both, moreover, it is associated with the *Dicroceros* type. The two phases of antler development in the Mid-Meiocene age in Europe, and probably at the same age in North America, are represented by living deer, first by the transient condition of the young antler in the velvet, and secondly by the second antler in most species, and by the simple-forked upright antler of the adult muntjac.

The antlers also of the adult fallow deer (*C. dama*) present variations which can, in my opion, only be accounted for by the doctrine of evolution. The ancestral form appears in the Pleistocene age in Britain, and is characterised by antlers palmated in front, instead of behind the beam, as in the normal living species, from which I defined it under the name of *C. Browni*, after its discoverer at Clacton, in Essex. It occurs also in the gravels of the Thames Valley, at Acton. Sir Victor Brooke has pointed out that some three or four specimens out of the vast number of antlers of the living form which he has examined possess exactly the same character. Its appearance in the living form may be explained by the hypothesis of a reversion similar to that by which from time to time a horse is born with three toes, due to its descent from a three-toed ancestor.

SWALLOWING ARTIFICIAL TEETH.

THE *Lancet* records the following case, reported by Mr. Frederick S. Palmer. M.R.C.S., L.S.A. :—

A gentleman came to my house at 2 a.m. on Friday, October 21st, with his servant, who, he told me, had just swallowed her artificial teeth. The girl gave the following account of the accident.

She went to bed as usual at eleven, and awoke at 1 a.m. with a slight attack of coughing. Immediately after the paroxysm she felt the plate, with two artificial teeth attached, drawn into the pharynx, and glide down the œsophagus, probably by a reflex act of deglutition. Some six months before she had broken off a portion of the plate, together with a gold hook, which held it in position round one of the left upper molars, so that at the time of the accident it was secured only by one small hook on the opposite side. She complained of soreness and a feeling of obstruction at the posterior part of the cricoid cartilage; but beyond her own statement there was nothing in her appearance to suggest that she was the victim of so serious an accident. Her respiration was perfectly natural, unattended with difficulty or pain.

Exploration of the mouth, pharynx, base of the tongue, fauces, and glosso-epiglottidean folds, with the index finger, gave a negative result. A horsehair probang was then gently passed down the œsophagus for about seven inches and a-half, where it met with a slight obstruction. This immediately gave way before the instrument, and both passed into the cardiac orifice together. There was no time to expand the probang; the obstruction was no sooner felt than it disappeared. As she had not taken food for some hours before, and I was unwilling to risk the chance of laceration of the œsophageal wall, or possible impaction of the foreign body at the narrowest part of the canal (the back of the cricoid cartilage) by the administration of an emetic, I sent her home with directions to eat plentifully of bread and milk, suet pudding, and rice, also to commence the treatment forthwith. I saw her again at 9 a.m., and in the absence of symptoms I decided to continue the expectant method, and watch for results, at the same time directing that all evacuations should be carefully searched. She was recommended to remain in bed, to take only small quantities of liquid in addition to the soft food, and a dessertspoonful of castor oil as a gentle laxative. The bowels acted well at 4 p.m. At 10 p.m., my next visit, she seemed perfectly well, not complaining of any pain or discomfort.

The following morning, October 22nd, at nine, she complained of colicky pain round the umbilicus, which she attributed to the oil taken the previous day. Temperature 98·6°; pulse 92; respiration 20. Nothing could be detected by manipulation of the abdomen. A large linseed poultice was ordered to cover the surface, and a second dessertspoonful of oil was administered. She passed a copious evacuation at 7 p.m., and the plate was discovered enveloped in a mass of fæcal matter, completely protecting the structures from injury, and voided apparently without pain or inconvenience.

Remarks.—There are several cases on record of rough jagged plates, with teeth attached, having been pushed with impunity into the stomach and passed per anum, but I venture to think this was one of the largest foreign bodies that have successfully traversed the whole of the alimentary canal. The most remarkable feature in connexion with the case is the almost entire absence of pain experienced by the patient during its transit, and it is also singular that the sharp gold hook escaped attachment to the folds of the ileo-cæcal valve. The patient appeared in perfect health during the time, and expressed no anxiety as to the result.

SCROFULOUS DISEASE OF THE GUMS.

THE following case of scrofulous disease of the gums is recorded in the *Specialist* by Mr. Edward Keen, M.R.C.S., Dental Surgeon to the Great Northern Hospital:—"A woman came to consult me at the hospital the other day about a boy aged five and a half years. He had a rather large head and rickety legs and wrists; otherwise he was a healthy-looking boy. She said his father was a healthy man, but she herself complained of a cough in winter, and was certainly a delicate-looking woman. The father's mother had died of consumption. Her four other children were healthy, although all had had thrush. On examining the boy's mouth, I found that all the lower temporary incisors had (as the woman described it) tumbled out, also the right lower temporary second molar, there being no signs of the permanent teeth. Of the right lower temporary first molar the fangs were all exposed by the absorption of the alveolus, and it was so painful that I removed it. The right lower temporary canine fang was also much exposed and loose, but as it was not painful I left it. The gums were somewhat congested and puffy, but I did not think that they called for treatment. The case was no doubt one of scrofulous disease of the gums, and as I was anxious to watch the progress of the case, I begged the woman to bring him again from time to time, but this she has not done."

CASES OF HARE-LIP.

IN a recent number of the *Dublin Journal of Medical Science* there are recorded one case of double, and another of single, hare-lip, by Dr. Richard G. Butcher. In the same journal for 1877 he also described two rare and terrible cases of double complicated hare-lip in mother and child, each accompanied by the most horrid deformity. There is no other instance on record of a mother and child presenting themselves for operation at the same time for the same frightful deformity.

Double Complicated Hare-lip, with double cleft palate hard and soft; projecting intermaxillary bones united in a solid mass, the vomer being greatly thickened and expanded from the point of their attachment—the entire standing prominently forward, with four crooked teeth; the nose was thrust entirely over to the left side, its massive apex pointing more remarkably in that direction, while the alæ were spread out quite horizontally, so that a more hideous arrangement could not be depicted; Cured without deformity:—

E. W., aged six years, the daughter of healthy and well-looking parents, without the least irregularity either in mouth or lips. This infant was the first child; three have been born since, all healthy and no mark whatever. I had seen the child when an infant, and several times at intervals of some months after. From the first it was such a puny little creature, with so little vitality about it that on several occasions, though severely pressed, I declined to operate until the child should gain age and strength, as the operation should be a most severe one, owing to the extensive and horrible deformity present. For twelve months, and up to the present time, November, 1878, the child was kept near the seaside, and most carefully fed and attended to, and so the child steadily improved, and now it was brought up from the country for my opinion. I considered it in a sufficiently healthy and strong state for the operation. The fearful amount of deformity in this case exceeded anything almost that I had ever seen; the superior maxillary bones on either side were very imperfectly developed, while the entire nasal organ was enormously enlarged; the soft and hard palates were altogether absent, and the vomer was inordinately developed, proceeding from behind, about its normal size, and thickening for about half an inch, it began gradually and rapidly to increase its dimensions, and, as it approached the intermaxillary bones, was fully half an inch thick, forming a great unsightly buttress, on the front of which were impacted and grown into the two intermaxillary bones, standing prominently forwards, almost directly forwards. These bones were unnaturally large, and covered with thickened gum deposits on either side, the entire piece standing almost straight out and an inch across, while its depth was three-quarters of an inch; four small teeth stuck directly forwards out of this protruding mass. The depth of the vomer in front, where fused into this mass, the mass being partially covered by a small piece of integument, was quite unnatural, being just an inch, while its massive thickness was, as already mentioned, inordinately increased. This osseous arrangement made the whole nose stand forward more than a half greater than it ought to be, while the whole organ, septum and intermaxillary bones, were united somewhat to the left side. The alæ nasi were much longer than natural, dragged outwards almost horizontally, flattened and matted, far away from each other, into the undeveloped superior maxillary bones. At the period of life of this patient with double complicated hair-lip the tongue is always greatly enlarged; so here, the organ was fully half again its natural size—this increase of size, this enlargement, adds greatly to the difficulty of getting safe union after operation, as it becomes troublesome, not only by its bulk and motions, but by its determined pressure forwards. Considering all the points in connection with this very serious case, the hideous deformity and the magnitude of the central mass, the removal of it, to a certain extent, being absolutely essential to allow of the formation of a septum between the nostrils, the formation of this and the closing up of the great gap in front, created such an amount of work—work that should be quickly done—as to make the surgeon very anxious and reliant on himself in undertaking so arduous a task. I shall now proceed to describe the several steps of the operation:—

On November 8th (Friday), 1878, the child was operated on after the following manner, and more assistants were required than usual for the operation of hare-lip, owing to the advanced age of the child and the numerous complications which had to be dealt with:—The child being rolled up in a sheet, mummy-like, the arms steadily secured downwards, the feet also steadily bound together, was given into the arms of a strong young man, sitting in a high chair, with the patient's head resting on his left shoulder. The head was then steadied in this position by a second assistant standing behind the patient; a third assistant stood at my right side to compress vessels, &c. Standing in front of the patient I passed a tenaculum into the central fleshy flap partially covering the projecting intermaxillary mass, a little to the right side of the mesial line, and dissected it up rapidly *from the bones far back*, fully an inch and a half. I proceeded next to deal with the osseous projecting mass, clipped it across high up at its most projecting part, and endeavoured to force it back. This not being readily accomplished, with a narrow-bladed forceps I quickly clipped from beneath a large triangular piece, base below; this facilitated the forcing back of the most projecting mass; but, even when so satisfactorily forced back, the posterior prominence was still too great. Cut the thickened septum far behind; the hemorrhage was so sharp that I thrust a couple of reddened wires into the chief vessels supplying this central osseous mass; but this did not quickly arrest the loss of blood, which was rapid, so I removed the osseous part rapidly with the bone forceps, retaining as much as possible behind to support the central septum formed from the soft part held over the tip of the nose carefully preserved—the thermo-cautery proved effectual in arresting any further flow. A tenaculum was then inserted into the left half of the cleft lip where its red margin curved into the lip—the piece well held up—and it and the left ala carefully detached from the maxillary bone over as far as the infra-orbital canal, and high up, so that when the part was drawn from the left to right it readily yielded and came across to what might be considered the desired point. I next inserted the tenaculum through the right side of the lip, and at a similar point to that effected on the left, and so rapidly dissected up the lip and ala from the maxillary bone to a similar distance as that described on the left side; the detached lip and ala were drawn from right to left, and it was proved quite sufficient for juxtaposition with the opposite; pressure was carefully kept on the detached lip on either side to prevent bleeding. All being well freed from osseous connections, I held up the tenaculum through the left half; I applied my curved scissors closely outside the tenaculum, and, pressing it well up to the ala nasi within the nose, cut out the tenaculum with the transfixed part. In a similar way the right portion of the lip was dealt with. An effort was next made to bring the portions of the lip, right and left, together with the alæ nasi forwards, when it was found that owing to endeavouring to preserve too much of the central osseous part (so essential) the soft parts would not come together without an unnatural strain; therefore, I had to resort to the removal of more of the central piece, though influenced by the most determined conservative measures. The hemorrhage, which again threatened, had to be arrested by the application of the thermo-cautery; the bleeding ceased, and now the parts could come well up, and together, and meet the central piece, preserved and pared for the septum. A long fine needle was then passed from about a quarter of an inch external to the left ala nasi, and made to travel from left to right, about an eighth of an inch above its curved margin; appearing on the inside, it was made to go through the septal soft triangular piece about its middle (the point of the nose being depressed to facilitate this result, and held so), the needle passing through was forced through the right ala nasi, and beyond it about a quarter of an inch through the cheek, corresponding almost exactly to the point of entrance of the needle on the left side; so the needle rested very evenly across, fulfilling every object, bringing up the nose and maintaining the central septum piece in perfect adjustment, on the cheeks being forced forwards. The silk thread was then thrown carefully around the needle in the figure of 8 form—no dragging of the cord, but the soft parts well pressed forward, evenly approximated, and then the cord cast round to prevent the slightest separation or retraction. Thus all these complicated cut surfaces were held accurately in contact, and without any biting constriction. A similar needle to the first was now introduced about three-quarters of an inch external to the cut surface on the left side, and just at the junction of the red line of the lip and skin, and made to travel from left to right deep through the muscular structure, close to the mucous membrane, and on appearing was carried across, striking the right half exactly at a corresponding point and making its appearance on the right side through the cheek, and at a like distance from the cut margin to that on the right side. On pressing forward the cheeks, the surfaces readily came into the closest contact—for there was no restraint or tightness in this direction at all —the red margins of the lip so pressed forward most accurately corresponded; and then I cast the silk cord (in figure of 8) from side to side with very gentle pressure, each turn made to lie very evenly, until the entire wound through the red part of the lip was all covered. A third needle was inserted with the same precautions as the previous ones, away from the red margins a long way, deeply through the tip, close to the mucous membrane, so as to bring the part throughout its whole depth into perfect apposition, the cord being passed around with the same gentle care as the former ones. The parts lay most beautifully together. During these several steps of this complicated operation, the child had to be frequently fed with teaspoonfuls of brandy and water. The ends of the needles were next clipped off with the pliers. A narrow strap of plaster was placed on the tip of the nose, and fastened down after the nose was virtually twisted straight from left to right, both to sustain it straight, and also to take traction off the central piece. This method I have often adopted and before advised. The wide straps of plaster hollowed out for the chin, and which I have employed for years to keep the cheeks forward and take tension off the needles, were next applied, and acted with their usual efficiency. The mode of the application of the plaster which I have over and over laid down in my "Operative Surgery," when dealing with the subject of hare-lip, is very simple and most effective. The operation finished, the child was now ordered, according to my usual practice, small doses of laudanum, which quickly quieted her restlessness and irritation—in fact, the infant was half narcotised. The little creature, shortly after awaking, took some warm milk, and again went off quietly to sleep. It is not necessary to particularise the management of the child up to the morning of the 11th. Up to this time she was kept gently under the influence of opium, and took abundant quantities of milk, chicken broth, and rusks grated in it. On the 12th, at 11 o'clock a.m., I removed the needles, having at 10 o'clock given nearly a double dose of the opium mixture, so as to thoroughly quiet the child before putting her to pain. The child was very steadily held resting on the nurse's left shoulder, while the cheeks were gently pressed forwards. I then extracted the upper needle first, catching it in a forceps, having previously greased its ends, and drawing it from left to right, while the index finger of my left hand pressed gently in the contrary direction to which the needle was travelling, and so by this arrangement guarding against any traction here made on the wound. In a similar way the needle upon the red margin was removed, and so also the middle one. When removed, the gentlest touch took away the silk cords which remained lightly glued to the lip. These being very hard I removed them, and then the perfect nature of the operation was all revealed. The nose and septum were perfect, and the incision wounds all thoroughly healed, the lateral sides of the lip most perfectly to the lowest border of the red margin, while the V-shaped piece to make the septum was united with the lateral portions of the lip to its very smallest point. Nothing could be more perfect than the way in which nature responded to all my efforts to secure union throughout. Adhesive straps, very narrow were then most carefully applied, the cheeks being well pushed forwards, so as to restrain any traction on the recently-united parts ; the wide piece of plaster curved under the chin and carried up to the temples, and so fastened as to prevent the slightest retraction of the cheeks, and so maintaining the newly-united parts in position without the slightest drag upon them. A strap was also placed from the forehead down along the nose, so as to keep its point down, and so resist the dragging up of the central V-piece of the septum. From this the child gradually began to gain strength ; beef-tea and chicken broth, with bread crushed up in them, were constantly given, and milk in abundance. In a fortnight after the operation, all plasters and straps were thrown aside, and really the condition of the child at this time was everything that could be desired. There was no deformity now. The nose was well up and straight in its position, and the union perfect throughout. No one, as the child's father and mother said, could possibly recognise the child, or believe that such a change could be effected. There is one very important point I shall mention :—Whereas, before the operation, the child made efforts to speak, uttering unnatural guttural sounds, a fortnight after the operation she could speak many words quite distinctly, and in a month could express herself quite intelligibly. The child returned now to the country, and rapidly recovered strength and health after this formidable operation. In eight months after the operation I saw the little child, and scarcely anyone could believe she was the frightfully deformed creature she had been before the operation. She was now, eight months after the operation, really a very pretty child, and the marks of the operation were scarcely to be seen, standing at a short distance from her, and the regularity and evenness of her face mainly contributed to this result.

(*To be concluded*).

DENTAL HOSPITAL OF LONDON.

ANNUAL DINNER.

THE Fourth Annual Dinner of the Past and Present Students of the Dental Hospital of London was held at St. James's Hall on the 2nd ult., Mr. Edwin Saunders, F.R.C.S., in the chair. Nearly 100 gentlemen sat down to dinner, but the present students were not largely represented. The *menu* was a very good one, but there were many complaints regarding the attendance.

The CHAIRMAN, in proposing the health of "The Queen," and of the "Prince and Princess of Wales and other Members of the Royal Family," said that Englishmen are not English if not loyal, for under no other form of government than a limited monarchy are like liberties to those which they enjoyed obtainable. Our Queen rules in the hearts of the people, and there is now a large American contingent to be reckoned as under her sway. An effort to do well is needed on the part of the ruler as well as on that of the governed, and thrice happy the people who have in their sovereign the virtues of our Queen. The Prince of Wales, carefully avoiding any partisanship in politics, devoted himself to the interests of society, and all know how ably he is seconded by the much-beloved Princess.

The next toast was that of the "Army and Navy," to which Mr. J. Smith Turner replied.

The CHAIRMAN, in proposing the toast of "The Past and Present Students," said at this banquet, which he trusted would continue to be annual celebration, those who had completed their studies renewed the friendships of their student days. Youth was the time of making friends, and of all the friendships none are more cherished. Such attachments have a three-fold aspect. First, there are formed between one another, as fellow students, the bonds of life-long intimacy; secondly, there is the friendship with the teachers which gives rise to mutual interest; and thirdly, the regard for the institution which is the scene of their student career—their *alma mater*. As a man thinks of his mother far above simply the level of womanhood, so the student, though the school may not be of the very first rank, believes his *alma mater* to be worthy of the cherished feelings of respect. The London Dental Hospital was well situated as regards light, and, in a professional aspect, it was well fitted for its purpose; and at the late Medical Congress the school was able to hold its own against the contemporaries of the Old and New World.

MR. W. C. WILLIAMS (Leamington), replying as an old student, alluded to the past students having many advantages, chief among which was the good fortune to have officers over them who were able to make those who sought their teaching efficient members of their profession. He remembered one of their late teachers, Mr. Hepburn, telling them to do the right thing and don't be afraid of the results, and that motto he (Mr. Williams) would hand on to the present students.

Mr. Hearn, as a present student, spoke in flattering terms of the officers, and also of the Dean, for the systematic management of the school.

Mr. Underwood proposed the toast of "The Dental Hospital and Staff." In the course of his remarks he said that twenty-three years ago a movement was made, which has produced most momentous results, and that was the establishing of the London Dental Hospital School, and by its means to instruct and educate the future representatives of the profession. With the assemblage around their table that evening of so many who owe their success in life to their hospital studies, it could well be understood what the feelings of the promoters of that scheme should be. With regard to the staff, the students now had advantages which in his young days did not exist; and he was sure the great sacrifice of two or three hours a week to teaching, which the staff of the hospital now devoted, would be fully understood by those past students who were in practice.

Mr. Alfred Hill, in replying to the toast, spoke of having had the honour of assisting in founding the Dental Hospital of London, and from that time to this he was proud to say he had never been out of harness, and he did not now feel any the worse for that uninterrupted work. If the staff need any stimulus to continued devotion, he was sure that the results achieved by the students, and the assistance rendered to them, would enable the staff to go on doing their duty. The Institution was not simply a private one, but it was of public importance. The other day he had the pleasure of conducting a Russian gentleman over the Hospital, who expressed himself well pleased with what he had seen, and also his intention to endeavour to establish a similar institution in St. Petersburg. They had one object, and their entire energies were devoted to that—success. They had the fullest desire to so educate the young men that they might in time succeed them (their teachers) in the profession, as better members than they themselves had been.

Mr. Cartwright proposed "The Medical School," and, in the course of his remarks, said the success of a school depends upon the mode of instruction in that school. Many of the pupils who had been under them as teachers, were not only exemplary students but they had turned out to be successful practitioners. They had found it necessary to supplement the efforts of the lecturers with the appointment of a demonstrator and a tutor, and the success of the students at the examinations was a proof of the efficiency of the Medical School.

Mr. C. S. Tomes, in responding to the toast, said the lecturers enjoyed several advantages. They were subject to the discipline of the Dean; those of them who lectured during the summer session had the benefits of early rising; and they also hoped to give advantages to their students by the teaching which their lectures were intended to impart. But whether or not lectures were the best method of teaching, was dangerous ground upon which to travel. He was glad that they had, in coupling his name with the toast, given evidence that in their mind, at all events, there was no manner of doubt.

Mr. ALFRED WOODHOUSE gave the next toast—"The Chairman." He referred to the additional privileges which the present students enjoyed over the past students, and among which he said was the change of site of the hospital from Soho to Leicester Square, and for that they were very largely indebted to the munificence of their Chairman. Mr. Saunders was also a trustee of the Hospital from its foundation; and by his continued efforts and devotion, and his many noble gifts, had he raised the character of their own profession. As an example of how their Chairman, and through him their specialty, was respected, he (Mr. Woodhouse) instanced the fact of his being President of the Metropolitan Branch of the British Medical Association. The toast was received with harmonious acclamation.

The CHAIRMAN returned thanks and said that when it was intended that he should preside on that event, he could not but remember how ably the chair had been filled on former occasions by those who were perhaps more intimately associated with the students. It, however, gave him great pleasure to preside, for such occasions gave rise to thorough fraternisation on the part of the past and present students.

Mr. ALFRED CANTON proposed "The Visitors," to which Mr. W. J. Miller responded; and the DEAN "The Musicians," and Mr. David Hepburn replied.

Additional interest was given to the proceedings by the singing of several solos, part songs, and selections, which were rendered in a very creditable manner.

GENERAL MEDICAL COUNCIL.

EXECUTIVE COMMITTEE.

AT a meeting of the Executive Committee of the General Medical Council, held on November 11th, 1881, there were considered several applications from Dental apprentices requesting to be registered. Only those who had completed their articles before January, 1880, were admitted to the register, and the remainder were recommended to apply to one or other of the licensing bodies for examination, that they might claim registration in virtue of possessing a dental license. To aid such young men to obtain a qualification, the Registrar was directed to call the attention of the Licensing Authorities in Dentistry to the last part of Clause XXXVII. of the "Dentists' Act," and to suggest whether it may not be desirable to admit to examination, under conditions more or less exceptional, those students whose apprenticeship commenced before the passing of the "Dentists' Act," and did not terminate before the 1st day of January, 1880.

The following important communication from Professor Turner was read in regard toDental Students:—

Edinburgh, October 31, 1881.

My Dear Mr. Miller,—As you are aware, during the autumn, some questions have arisen as to the meaning of the regulations of the General Medical Council relating to the education, preliminary examination, and registration of Dental Students. I am desirous that you should bring the matter before the Executive Committee, so that more specific regulations may be framed.

1. In the "Dental Curriculum" approved by the General Medical Council, nothing is said of apprenticeship. A certificate of having been engaged four years in professional study is required. Medical students are allowed to count one year of apprenticeship as one of the four years of professional study. Ought not Dental Students to be put on the same footing?

2. Three years' instruction in Mechanical Dentistry is required. It is not stated if these years are to be during the four years of professional study, or may be taken, in whole or in part, antecedent to registration as a Dental Student.

3. It seems advisable, therefore, that the expression "four years in professional studies," should be more precisely defined. Is it to mean: (*a*) four years in a dental school or hospital; or (*b*) may one year of apprenticeship count as one of the said four years; or (*c*) may one or two years passed as a Mechanical Dentist in a dentist's workshop similarly count?

4. May the time spent under (*b*) and (*c*) of (3) be regarded as a legitimate portion of the specified four years, even if spent before passing the preliminary examination in arts, that is to say, before registration? It seems to me only reasonable that some portion, if not the whole, of the three years to be spent in Mechanical Dentistry should be allowed, even if taken before registration, since there is nothing rendering a literary examination necessary previous to entering on workshop duties, as there is prior to entering on a course of scientific lectures; and secondly, it will scarcely be practicable to go through an efficient training in the workshop, if during the same period the student's time is to be occupied in attending several courses of lectures, and in following the practice of a dental hospital.

Believe me, very truly yours,

WM. TURNER.

It was resolved that the consideration of Professor Turner's letter be deferred, and that it be forwarded to the various Dental Examining Boards with a request that they will take it into consideration, and favour the Executive Committee with any observations thereon.

A communication was read raising the question as to whether a

Dentist who, in addition to being registered as a "United Kingdom" Dentist, has another qualification which would entitle him to registration in the list of "Foreign Dentists,"should have his name in both lists, or have an option given him to decide in which one it should be entered; and whether, if entered in both lists, all the qualifications should be appended in each list, or only that one in respect of which it appears in such list.

The Committee resolved—That in the case of Dentists legally qualified in Great Britain, the Colonies, or Foreign Countries, they have the option of being entered in either of the lists, with all the legal qualifications which they possess.

ODONTOLOGICAL SOCIETY.

THE usual monthly meeting of this Society was held on the 5th ult., Mr. THOS. ARNOLD ROGERS, President, in the chair.

Mr. G. PEDLEY showed a piston arrangement adapted to the cork of a bottle, by means of which a few drops of fluid could be forced out of the bottle, thus saving the trouble of removing the stopper. He also brought before the notice of the meeting a "Tell-tale," to indicate when gas is or is not issuing from the ordinary nitrous oxide iron gas bottle. It consists of a bottle, similar to a wash bottle, containing a small quantity of water. This is connected with and between the iron gas bottle and the inhaling bag, and the gas in passing through it bubbles through the water. If the valve of the iron reservoir be quite closed, that will be indicated by the non-passage of gas through the water of the "Tell-tale." He likewise exhibited an upper molar which he had extracted, and to which was attached part of the floor of the antrum.

Mr. W. E. HARDING mentioned the case of a middle-aged lady for whom he had treated a Dental pulp with a preparation of arsenious acid. He was very careful in limiting the area of application, and also in securing it with varnish. In about three days she showed symptoms of arsenical poisoning, in the form of gastric irritation and of a rash upon the skin, with ultimate desquamation. It was ascertained that on three previous occasions when the patient had been treated with arsenic—once locally, by a dentist, and twice constitutionally, by medical men—similar symptoms appeared.

Mr. COLEMAN read a paper on "Economical Processes of Preparing and Administering Nitrous Oxide Gas." In the ordinary preparation of nitrous oxide gas from nitrate of ammonia there was a great amount of time required, and the expense was great. To charitable institutions the latter item was one of considerable importance, the Dental Hospital of London, in the year 1880, having spent £73 18s.; and since the introduction of the gas in 1863, the amount paid for nitrous oxide has been £680 14s.—the cost of each administration being from 1s. to 1s. 6d. The cost of production from the nitrate of ammonia was about 8d. per gallon. According to Graham, nitrous oxide can be obtained by dissolving zinc in nitric acid, but the gas contained as impurities some of the higher oxides of nitrogen. By generating the gas at a low temperature, and with suitable wash bottles, it can be collected free from such deleterious compounds. Though the direct cost of production by this method is very much more expensive than by the ammonia process, yet that is so much reduced by the recovery of the nitric acid, and by the sale of the bi-product of sulphate of zinc, which at present brings 35s. per cwt., that the gas could be supplied at the rate of 1d. or 1½d. per gallon. This process could only be successfully carried on on a large scale. Mr. Coleman referred to the experiments of himself and others to purify the expired gas by passing it over slack'd lime and then to rebreath it; but that is now discarded, because it was found that after two or three full inspirations of the gas little or no carbonic acid was given off in expiration. The plan was adopted of letting the expired air and gas of the first few seconds of administration escape, and then, opening the valve of the supplemental bag, to breathe over and over again the contents of that bag. But he thought that if all the expired gases were collected during the whole time of administering the nitrous oxide, the air and carbonic acid could be removed and the pure gas recovered. This may be accomplished by receiving the expired gases into a closed vessel containing a weak solution of caustic potash. The potash would fix the carbonic acid, and the water would absorb the nitrous oxide, and then the air would be set free. The nitrous oxide could be driven from the water by heat and collected in another gasometer.

The PRESIDENT having made some observations,

Mr. W. V. MOORE spoke of ordinary metallic zinc containing arsenic, and that in Mr. Coleman's process that impurity would have to be provided for.

Mr. STOCKEN said that nitric acid of 1·5 specific gravity was seldom free from nitric oxide; and referred to the cost of labour, the increased price of zinc which a larger demand would necessitate, and the much greater production of sulphate of zinc which would considerably lower its present market value, as items which would, he thought, scarcely permit the sale of nitrous oxide at the price Mr. Coleman had quoted.

Mr. BRAIN, referring to certain deaths which had occurred during the exhibition of nitrous oxide, did not think they were due to the gas. He said that if a patient were dying from syncope the inhalation, even by means of artificial respiration if necessary, of nitrite of amyl, was the best means of making the heart re-beat.

After some remarks by Dr. Sternfield and Dr. Cunningham, Mr. Coleman replied, and the meeting adjourned.

ODONTO-CHIRURGICAL SOCIETY.

The ordinary meeting of this Society was held on December 8th, Mr. Andrew Wilson, L.D.S.Edin., Vice-President, in the chair.

Mr. John A. Briggs read a paper on "Vulcanite Dentures," of which the following is an abstract:—

Somewhere about twenty-six years ago Rubber was introduced into this country by Mr. Putman, of America, for the manufacture of Artificial Dentures. Great efforts have been made since then to improve the machinery requisite for its manipulation—I mean the vulcanisers, flasks, clamps, &c.—the principal object in view being the shortening of the time required for the vulcanisation of the Caoutchouc, the utility of which I very much doubt, for, as commonly treated, I have little hesitation in saying that, under higher temperature and diminished time in vulcanising, the vulcanite suffers in elasticity, density, and durability. Much as has been done in the way of improving machinery, comparatively little has been done in improving the original method recommended for the modelling up of cases, flasking, packing, &c.

Some twelve years ago my attention was awakened to the fact that plaster of Paris was only reliable under certain conditions as a model. It is essential that it be fresh and crisp, that no foreign material, such as salt, alum, borax, or even hot water, be mixed with it to produce hardness, as the hardness so acquired is very deceptive, enduring only till introduced into the vulcaniser. Now plaster which deteriorates to any great extent vastly impairs the fit of the case, because in cooling, vulcanite has almost as great a tendency to contract as it has to expand under heat. How often is a model which has lain on the bench for days ultimately taken and set in a flask and vulcanised upon? Now in no case does plaster make a thorough union with the surface of plaster already set, but the older the set piece the more imperfect will be the union. Therefore it is desirable that in flasking a case (especially where there are teeth upon the model, aggravated by being undercut, or standing at various angles) that the mould consist of but one piece, or is made in as few divisions or mixtures as possible.

In all cases where a model is cut and trimmed up to sit in a flask around which plaster is poured, there is great danger of the model yielding when pressure is applied, and this yielding is all the more deceptive because of its slight character. If we consider the thinness and the material of which many of the flasks in use are composed, I think it only matter of surprise how cases made under these difficulties fit at all. In my opinion, cast-metal and gun-metal are useless materials to make flasks of. The one is liable to fracture, and the other to twist out of shape. Besides, flasks are made with a lid, the use of which I have never been able to comprehend. This flask of my own design has been in use for some years, and is little the worse. It is made in two pieces; is thick and strong, being made of malleable cast-iron. Having a reliable flask, I next devised a means by which the model and setting might be made in one piece, which I achieved in this way: I take a piece of ordinary pink wax, soften it in hot water, and press it up to fit the bite-model—this must be very accurately done, and that, too, without thinning the wax—pressing up the rugæ carefully with a burnisher or other convenient instrument; mount the teeth upon this, and try in if necessary; if all is correct, heat again in hot water, and press up carefully, then cool it in cold water. Stiffish plaster is then mixed, the first part of the flask half filled. The case is now inverted and filled, reverted and inserted into the plaster in the flask. The plaster is then built up to and over the edges of the teeth. When hard it is soaped, and the other half closed and lightly clamped. When hard, open and wash out, and we then have a mould composed of but two pieces. This may now be packed with the absolute certainty of being a *fac-simile* of the wax set in every particular when vulcanised.

I claim for this method a vast saving of time, trouble, and material, and also a more accurate fit. The time and trouble of taking a duplicate is avoided: the permanent model is retained; the bite is very rarely disturbed; there is very little superfluous rubber wasted; and the case requires much less time and trouble in finishing; the piece slips into its place in the mouth without the usual touching up; the vulcanite not being forced into unnecessary undercuts and interstices, as when vulcanised upon a model.

I also hit upon a plan of diceing the fitting surfaces of cases, which is very simple, ornamental, and useful, helping to steady and increase the suction of a case, and having the further advantage of precluding the possibility of the surface being tampered without being detected. This is accomplished thus:—Take a piece of netting the pattern of the plate, and a piece of tissue-paper of the same size, place the tissue-paper on the netting, and the netting on the model, before closing the flask. They both become embedded in the vulcanite, but will wash off with a brush when vulcanised, leaving a much clearer surface.

I am indebted to Dr. Best, of London (formerly of America), for a hint, which I hope he will pardon me giving to those gentlemen present who do not know it—namely, how to acquire the best adhesion in complete suction cases. By scraping the model all along the labial margin of the gums (avoiding the buccal muscle), then along the lingual margin, and finally across the distal margin of the palate, using afterwards a piece of very fine sand paper, it will be found that the suction of a case made from a model thus treated is far greater than that acquired from the use of discs, chambers, scratches, or other like contrivances.

Ere closing, gentlemen, I would like to say that in my opinion, too little attention is being paid to the æsthetic culture in the mechanical portion of the professional education of our Dental students. Were they recommended to study drawing, painting, and modelling, we would shortly have a great deal less of the incongruities that so often offend us.

The discussion of Mr. BRIGGS' paper was deferred to the next meeting of the Society.

Mr. WILSON exhibited an epulis, which he had removed from the lower jaw of a patient in September,

Mr. WATSON showed the models of a case of retention of the deciduous teeth long beyond the usual time, with absence of their permanent successors. The models were sent by Mr. Frank Richardson, and the patient is a lady of nineteen, intelligent and healthy, though rather undersized in stature. She retains in the superior maxilla all the temporary teeth, excepting the two central incisors, which are permanent teeth, and stand very considerably apart from each other. In the inferior maxilla there is only one permanent tooth, that of the first left pre-molar, which is very small and dwarfed ; all the other teeth belong to the deciduous set, and, moreover, are all in a very good condition in both jaws. There are, therefore, only three teeth of the permanent set present in the mouth, and no appearance of any more erupting. The arches of both jaws are very small, and present all the characteristics of childhood, which, Mr. Richardson says, gives the patient's face a somewhat cat-like appearance.

SOCIETY OF LICENTIATES ON DENTAL SURGERY.

(GLASGOW.)

The third annual business meeting was held in the rooms of the Society, Anderson's College, Glasgow, on the evening of November 9th. There was a large attendance of members, the President, J. R. Brownlie, Esq., occupying the chair. The Reports of the Secretary and Treasurer having been submitted and approved, the meeting proceeded to the election of office bearers and council for the ensuing terms. The following gentlemen are now the Executive of the Society :—

President, J. R. Brownlie ; Vice-president, W. S. Woodburn ; Treasurer, Jno. Melville ; Secretary, Donald Cameron ; Editor of Transactions, John Foulds ; Curator & Librarian, A. B. Young ; Council, Messrs. Jas. Cumming, W. H. Gray, Benjamin Sutherland, and William Lang.

The meeting then went into committee to modify the terms of the constitution and rules of the society.

In consideration of the flourishing financial condition of the society the council were instructed to purchase a selection of the more rare and valuable books, interesting and useful to the members of the society. A suggestion that the rooms should be opened for a few hours on a suitable evening every week, for the purpose of providing a place where the members could meet to enjoy a chat, compare notes, &c., was met with marked approval, and the council instructed to arrange accordingly. The President announced that he had the promise of several papers from members, and as the interesting paper on "Salivary Calculus," read by Mr. Melville at the last meeting, had yet to be discussed, they might look for a busy and profitable session.

A hearty vote of thanks having been accorded to the president, the meeting adjourned.

ANNUAL DINNER.

This pleasant event in the session came off on the evening of Friday, the 11th of November, when a large number of the members and their friends met in the Bath Hotel, Glasgow. The chair on this occasion was ably filled by JAMES CUMMING, Esq., the position of Croupier being occupied by JOHN FOULDS, Esq.

In the course of the evening, in proposing the toast "Prosperity to Anderson's College," the CHAIRMAN, in his usual fluent manner, set forth the benefits which the managers of Anderson's College had showered on the Dental profession in enabling them to establish a Dental School under such favourable conditions, and also the great advantages offered to students who, within the walls of Anderson's College, could find every class required by the curriculum, the only thing they had to go forth for was attendance at a general hospital. Even a Dental hospital was instituted within the buildings, and he believed that nowhere else could a student find such conveniences for study, much valuable time being often lost in running from place to place.

Professor A. M. BUCHANAN, Dean of the Faculty, in reply, said that Anderson's College had never been so prosperous as now, and it was with great pleasure that he was able to state that the connection of the Dental profession with the college had marked a decided increase in the number of students, and that he, as a teacher, had never had a harder working, more attentive class than that which was composed chiefly of Dental students. It was a source of considerable gratification for him to know that every one of the students who joined his class three years ago had now succeeded in satisfying the examiners, and were entitled to write themselves L.D.S.

Mr. MELVILLE, in proposing "Success to the Dental Students' Society," said that it might not be amiss to make a few remarks on the condition of their profession when he entered it, nearly half a century since, and to compare it with things as they are to-day, and to remind the students of the many advantages which they enjoy for training them up in the higher walks of their profession, which were denied to their predecessors of fifty years ago. In the olden time the dentist's apprentice required to be a lad of physique and of brains, and one whose fingers were not all thumbs. He had to learn to make every tool he required for himself, and that out of the rawest material. See him sweating over a huge walrus tusk with a blunt saw, cutting the ivory into appropriate pieces for the different cases, and trembling lest he should have the "governor" down on him for cutting to waste; thereafter working for many hours with gouge, scalper, and colour-pot, gradually fitting the bone to the model, then rasping and filing into shape, then carving the teeth or cutting recesses into which to fit human teeth, which were usually fixed with gold screws. They had to manufacture springs, swivels, wire plate, modelling trays, &c. At that time there were no great Dental manufacturing firms, the few "one-horse concerns," as the Yankees have it, supplying little else than ivory and human teeth. Now-a-days the Dental student (he was an apprentice fifty years ago) must have secured the education of a gentleman to enable him to pass his preliminary examination; he has his classes at college, his Dental hospitals, his societies; and in the mechanical department, what a change, everything supplied—tools of every conceivable form and degree of usefulness. Then there was no Dental literature, no Dental schools, no Dental societies, no communion of thought or interchange of ideas, in consequence of which jealousy and self-conceit predominated, and each Dentist hated the other with a good old-fashioned hatred. Now we have our journals, our societies of practitioners and of students, our schools, hospitals, &c., and are no longer a vagrant, disorganised army, each fighting for his own hand, but an united body striving to elevate the profession to its proper position, and it is gratifying to a veteran to know that the rising generation of Dentists are taking their part in a good fight, as it is by the institution of such bodies as the Dental Students' Society of Glasgow that the *spirit* of the profession will be kept up in future years. In wishing them every success, he trusted that after many days their successors may be able to look back on the archives of the society and say that the originators were "good men and true." He begged to couple the toast with the name of the president, W. S. Woodburn.

Mr. Woodburn, in reply, said that he had great pleasure in thanking Mr. Melville and the gentlemen for the kind way in which the toast of the Dental Students' Society had been proposed and responded to. It was a society in which he had a deep interest, and one which the members in future years would look back upon with pleasure as having been a distinct incentive to their upward progress, and he had no doubt that with the steady adherence of the present members, and a careful observance of the rules laid down, the society would go on and prosper. He was much pleased to be able to say that as regards funds and members the society was in a flourishing condition, that they had formed the nucleus of a library, and that the members were constantly on the look out for interesting specimens, a goodly collection of which had already been got together.

The toast of "The Dental Lecturers" fell to the lot of the Croupier, who said that he appreciated very highly the work of the Dental lecturers, but he was not inclined to include in that category only the gentlemen who lectured on the Dental specialties, but to include everyone who lectured to Dental students on subjects required by the curriculum. It was useless here to eulogise gentlemen who, as all present knew, had fulfilled their arduous duties in such a satisfactory manner, bringing success to their pupils, and credit upon themselves. He, however, could not refrain from specially mentioning the president of the society, Mr. J. R. Brownlie, to whose indefatigable efforts dentists in a great measure owe their present position in regard to Dental lecturers in Glasgow, and with whose name he begged to couple the toast.

Mr. Brownlie, in reply, returned thanks on behalf of the Dental lecturers, and said that it was fitting that in such a toast all the professors and lecturers should be included, seeing that in every instance they had so frankly and generously responded to the wishes of the students by forming classes specially for Dental students. It might be too much to expect that the splendid start made by the school should be maintained throughout; but he ventured to say, on behalf of his colleagues, that they had a strong sympathy with the big classes, and if the gentlemen present, whose sons are growing up to relieve them of the toil and worry attending the daily work of the dentist, will only send them in to fill up the ranks, the teachers on their part will undertake to do their best for them, that they may not only pass a good examination, but that they may carry with them into their daily work a well-stored mind, a well-drilled pair of hands, and an enthusiastic love of their profession. In all undertakings, dependant for success on something in addition to one's own efforts, a sense of anxiety must ever rest with those taking an active part in promoting such a work. In reading the proud boast made on behalf of a sister school that its fame had reached even to India, one could hardly help feeling interested at so vigorous an infancy. He had no knowledge then that they, too, were known in that far distant land, but he had now the pleasure of informing them that their fame had not only travelled as far, but that, within the last two days, a student had been enrolled all the way from India.

The toasts of "The L.D.S. Society," "The Dental Hospital," "The Ladies," "The Chairman," and "The Croupier" were duly proposed and honoured. The proceedings were enlivened by several songs, and a reading by the President was much appreciated, and at an orthodox hour the party separated, after having spent a most enjoyable evening.

Mr. Isidor Lyons, M.R.C.S., &c., has written a very concise epitome of Diseases of the Teeth in a new work, "An Index of Surgery," by Mr. C. B. Reetley, F.R.C.S.

THE STUDENTS' SOCIETY.

NATIONAL DENTAL HOSPITAL AND COLLEGE.

THE ordinary monthly meeting of this Society was held at Great Portland Street on December the 2nd, Mr. HARRY ROSE, L.D.S.Eng., one of the Vice-Presidents, in the chair.

Casual communications were brought forward by Mr. Bate (an odontome) and Mr. C. Rose (a case of osteo-dentinal bodies in pulp).

Mr. W. T. ELLIOTT read a paper on "The Oral Secretions." This is to be found on page 8 of this number of the DENTAL RECORD. An interesting discussion followed the reading of the paper, and the meeting adjourned till the 13th inst., when the annual meeting will be held, and an address delivered by the retiring President.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

COLEMAN'S DENTAL SURGERY.

To the Editor of the DENTAL RECORD.

SIR,—I believe it to be unusual for an author to express any opinion upon a review of his work, unless such review contains distinct errors in respect of the same. Under this latter impression I venture to call the attention of your reviewer to the following: In his last paragraph he states, that—"Of the causes of irregularity in position of the permanent, no mention is made of a not uncommon cause, namely, the premature extraction of the temporary teeth." Now, to this matter, four pages, viz.—74, 75, 76, and 77, with five illustrations, viz.—figs. 58, 59, 60, 61, and 62 are devoted. Again, in speaking of the ambiguity that exists in certain sentences, he says, "The first sentence on page 57 will serve as an instance of ambiguity—'an undue relationship between the teeth and the maxillæ.' Is the relationship one of proximity or size? We suppose it is one of size, but there should be no cause for doubt." I think there can be no cause for doubt if the sentence, of which the above is but a fragment of, and separated only by a comma from, *i.e.*, "where the latter are developed in excess as regards the former, and *vice versâ*," be completed.

With regard to the many examples of bad grammar stated to exist in the work, I venture, on behalf of the gentleman who kindly revised the proof sheets, and in the absence of precise information what the errors are to which allusion is made, to express the opinion that your reviewer has been somewhat hypercritical, and that no greater number exists than may be found in the ordinary run of English works of like size and technical character.

If every sentence is to be tested with the same severity with which you, in your leading article of the same number, pronounce the employment of the adjective *most* in preference to *more*, to be bad grammar in the following, viz.—"what are the most frequent causes of death of the pulp?" then I must admit that in my work, as indeed in almost every English work, will be found a great deal that may be termed bad grammar, although I trust that such an expression, or its like, as "for us to *venture giving* its meaning," will not often be found in it. It has been admitted to be almost impossible to construct a sentence against which, to use the words of Lindley Murray, "critical ingenuity cannot devise plausible objections."

I am, Sir, &c.,
Streatham, Nov. 25, 1881. ALFRED COLEMAN.

[Mr. Coleman in his letter takes objection to the review of his book which recently appeared in the pages of the DENTAL RECORD, and also to part of a sentence in our leading article in the November number. Regarding the latter we are glad of the opportunity of explaining the error alluded to. The sentence should have read—for us to venture *on* giving its meaning. The word "on" was by the compositor's oversight omitted, and in the final hurry which, as Mr. Coleman from his editorial experience knows, invariably is required before going to press, the correction was not made.—ED. D.R.]

To the Editor of the DENTAL RECORD.

SIR,—Some time back I saw a really useful column in one of your contemporaries devoted to the medical interest, headed, I think, "Our failures." As few men like to come before their professional brethren on such an unpleasant footing, the names of such correspondents were, I believe, not even required "as a guarantee, but not necessarily for publication." As more is often learned from failures than successes, I cannot help thinking you would act a useful and appreciated part by opening such a column in your RECORD; removing the usual restriction of "real name." Of course, reserving your right to omit altogether. I have had from time to time many failures, perhaps the experience of others could tell me why, if they knew the details.

Yours faithfully,
21, Duke Street, Manchester Square, W. GILBERT WALKER.
November 29, 1881.

Editorial.

APPRENTICESHIP AND THE PRELIMINARY.

IT is very desirable that more specific regulations be framed as to when the Dental student shall pass the preliminary examination, whether before, during, or after the required three years of mechanical instruction. Also as to how much of the required period of four years' professional education shall be taken up with mechanical instruction or apprenticeship. According to the interpretation of the regulations hitherto given by the General Medical Registrar and the Secretary of the Royal College of Surgeons of England, a student must spend four years in study after passing the preliminary examination. Two of those years necessarily are devoted to Dental hospital practice, and he may at the same time work in the whole of the general hospital studies. The other two years have, in the majority of instances, been devoted to serving part of an average term of four years' apprenticeship. Thus the student spends six years in professional education—an average of four years', or occasionally a minimum of three years', mechanical instruction, and at least two years' hospital studies—, but there is every reason for a good workman being turned out. The following is an example of how the four years' professional study may be gone through, after having passed the preliminary examination :—A premium may be paid for three years' instruction in Mechanical Dentistry ; during the third year the Dental and General hospital attendance can be commenced, and be completed by the end of the fourth year. The third year is almost entirely taken up with the work of the two hospitals, so that practically so little time is available for mechanical instruction, that the apprenticeship does not amount to more than two years. Though the pupil may have in this way complied with the letter of the regulations, it will be generally admitted that his two years' tuition and practice in the work-room will scarcely have provided him with that creditable mechanical ability which a Licentiate in Dental Surgery should possess.

The questions on the subject, which Prof. Turner has formulated, might, with propriety we think, be also referred to the representative board of the British Dental Association, as well as to the various Dental Examining Boards. That association is a representative body, at least of that portion of the profession most able to advise upon the matters which Prof. Turner has embodied in his communication to the Medical Council. That letter we publish on page 35.

ANNOTATIONS.

It would afford us much pleasure to insert in our pages any short account of "Failures," as suggested by Mr. Gilbert Walker. There is only one condition—that they be communicated.

It is, we are sure, a cause of much satisfaction that the Council of the Odontological Society has nominated Mr. S. Lee Rymer for election as President of the Society for this year.

An association is being formed for the purpose of adopting such measures as may be thought desirable to prevent unjust attacks upon biologists and men of science who may become subject to interference by the opponents of experiments upon living animals. The science of dentistry has yet to be enriched by knowledge which can only be gained by such experiments, and we trust the profession will give creditable support to the movement.

GOSSIP.

The Student's Society of the Dental Hospital of London purpose holding a conversazione on Tuesday, the 17th instant.

Harvard University has 1,382 students in its several departments, which is 94 less than the number at the University of Michigan.

Soldering dress rings without removing or discolouring the stones may, it is said, be accomplished by imbedding the stone-carrying part of the ring in raw potato.

The publishers of "The Dental Register," Cincinnati, have decided to reduce the price of the journal from $2.50 to $2.00; not give any premiums as hitherto, but to give each subscriber double the amount paid in a good, reliable Dental Journal.

Sir John Lubbock, F.R.S., lately stated before the Linnæan Society the results of his experiments upon the range of vision of certain crustaceans. He had already found that ants had the power of perceiving the ultra violet rays of the spectrum; and he now considers that the daphniæ certainly have the faculty of perceiving ultra violet rays considerably beyond the rays visible by man.

Professor Tait writing in "Nature" upon the pressure errors of the Challenger's thermometers, says a variation of half a degree Fahrenheit, per mile of depth, may seem to be a matter of very little consequence; but when we recollect that some of the Challenger's soundings were made at depths nearly approaching six miles, we find that we have sometimes to deal with a correction of three degrees Far., enough to modify seriously our theories of ocean circulation.

Professor Bell has devised another electric method, in addition to that of the induction balance, for detecting a bullet in the human body. It consists in inserting a fine needle near where the ball is supposed to be. This needle being connected by wire with one terminal of the telephone, while a metallic plate laid on the skin is connected with the other terminal, when the point of the needle reaches the ball a current arises, and a sound is heard in the telephone. The needle may be inserted in several places with little pain, and the pain may be prevented by means of ether spray. The method has been tested on a piece of beef containing a ball. Contact of the needle with bone gave no sound, but there was a distinct sound whenever the ball was reached. The arrangement may be modified by introduring a vibrator into the circuit; a musical sound is then heard when the needle meets the ball. The circuit may also comprise a weak battery. In this case there is a sound from the moment the needle enters the skin; but at contact with the ball the sound is greatly intensified.

"THE Dental Register" gives the following notice of the DENTAL RECORD:—"This is a neat and well filled journal of 48 pages, issued monthly, published by the Dental Manufacturing Company, No. 25, Broad Street. In the preface the editor says:—'The educational advancement of a body is always associated with the development of its literature. The DENTAL RECORD is the outcome of this advancement, and necessitated by the spreading influence of Dentistry as a profession. It will offer every facility for the publication of matters of interest to the profession, and thus give a stimulus to men to write, and communicate the results of their research and experiences, and their opinions.' Thus it will be seen that the RECORD is preparing for itself a large sphere of usefulness. There is, doubtless, room for this new journal. It should have a wide circulation, not only in European countries, but in the United States as well. With such contributors as Coffin, Coles, Elliott, Parkinson, Rogers, Stocken, Thompson, Walker, and Weiss, it cannot be otherwise than interesting and instructive. Let it have a wide circulation."

INTERCOMMUNICATIONS.

QUESTION.

(9.) A LOVER OF FAIR PLAY.—Is a Chemist who occasionally extracted a tooth as a Chemist, but made no announcement, by plate or otherwise, of being a Dentist also, previous to the passing of the Dental Act, to be considered as "*bonâ fide* engaged in the practice of Dentistry," and really entitled to have his name enrolled on the Register?

ANSWER.

(7.) STUDENT.—Probably the article on Page 1 will help you. If anything more is wished for, write.—ED.

Communications.

Communications have been received from Edward Trimmer, London; J. S. Cobb, Yarmouth; Geo. H. Perine, New York; John Foulds, Glasgow; George Ward, London; An Intending Subscriber; W. R. Humby, London; J. C. Foran, Eastbourne; Gurnell Hammond, London; W. Bowman Macleod, Edinburgh; H. Stocks, Haslingden; Barnard Lee, London.

Books, &c., Received.

"The Specialist;" "New York Times;" "Journal of the British Dental Association;" "Annual Report of the Dental Dispensary, Plymouth;" "Ohio State Journal of Dental Science;" "Transactions of the Eastbourne Natural History Society."

THE

DENTAL RECORD.

VOL. II. FEBRUARY 1, 1882. No. 2.

A NEW METHOD OF REGULATING THE INCISOR TEETH.

By W. R. Humby, L.D.S.Eng.,
Assistant Dental Surgeon to the National Dental Hospital.
Demonstrator of Dental Mechanics at the National Dental College.

There are now in use many plans for regulating teeth, each plan having its special application pretty clearly indicated by the conditions present in the several cases we are called upon to treat. Every method of regulation is useful *only* in its own field of irregularity; and to apply each in its proper place, giving the right medicine, as it were, for the disease under treatment, is our duty as Dental Surgeons. It is no less our duty to receive, from time to time, the raw material which may recruit the army of ways and means, upon which we shall, in some measure, have to rely in overcoming the common enemy, "Ugliness," when it assails the human face in its sweetest feature—the mouth.

I shall not now enumerate any of the numerous and excellent systems at present in vogue, but shall strictly confine my remarks to the description of a method of regulating the incisor teeth, which I venture to believe to be new, and which has been of great value in cases under my care.

The principle upon which all attempts are based for the regulation of the teeth is that the proper direction of any applied force shall be ensured as far as possible, and to bring this about we employ the resources of mechanics and our own individual manipulative skill and experience.

Now I must confess that it was the difficulty I encountered in some cases to put into actual practice some of the methods in ordinary use for directing the incisor teeth in a quick and sure way, which induced me to try to arrange them, if possible, by a plan abolishing plates in some special cases, and limiting their use in others, and then only as an adjunct or as a sequel to the actual Regulating force.

I think my first case will serve best to make matters clear. It was that of a lad, who came under treatment at the National Dental Hospital, and whose superior central incisors were very much displaced by the growth of a supernumerary tooth between them. The intruder had turned their median surfaces towards the lips, and on its removal, an immense space divided the central incisors.

The task of regulating the teeth was entrusted to a student, and he certainly did a great deal of good, though, necessarily, the progress was but slow. The student having qualified and left the hospital, the case was submitted to me. Having watched this case with great interest, I was very pleased to treat it, as it represented the type of irregularity upon which I was anxious to try conclusions from a new idea I had cherished for some time previously. The state of the mouth was briefly this:—a space divided the central upper incisors, through which the lad said he could pass a black lead pencil: The teeth were bi-laterally displaced, their lingual surfaces directed towards each other, and the cutting edges were nearly at right angles to the dental arch. Approximation and torsion were indicated, and, as the deformity was symmetrical, I determined to make the tooth on the one side supply the point of attachment for my power upon the other, and *vice versa*.

I first applied the rubber dam to the four incisors, then carefully cleaned them and dried them with an air syringe, and applied a layer of ether copal varnish. I then wound round each central a strand of silk, and tied it in a knot at the distal (or what should have been the distal) surface, leaving the ends of the ligatures free, as shown in fig. 1.

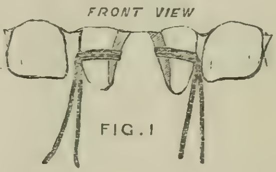
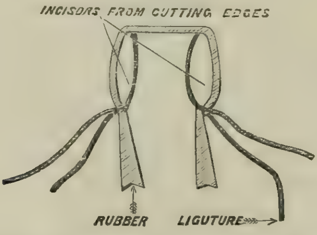


FIG. 1

I then included in the silk of the one side a strip of the white vulcanized rubber dam in use in the hospital (the rubber was about a quarter of an inch wide and of the stoutest variety), and stretched the free end of rubber until the traction seemed to me strong enough for the purpose. I then included it by tying in the second ligature thus—fig. 2. I now varnished the silk, especially the knots, cut off the surplus rubber and silk, removed the protecting rubber dam, and

FIG. 2



requested the patient to see me in a week. He came, according to appointment, and I was quite delighted with the progress made—the teeth met in the median line, and the only thing remaining to be done was to increase the torsion, as the teeth, viewed on their cutting edges, had a slightly gothic arch-like expression. I lifted the first strip of rubber and inserted beneath it a small pad of the same material, and tied this to the first. The case then had the appearance shown in fig. 3. I solicited his attendance on the following week, but he never came, and I am thus compelled to present an incomplete case; yet, to my mind, enough was seen of it to justify the conclusion that it had progressed very well, and to induce me to use a similar method of treatment in many cases since. I believe bi-lateral displacement, as in the case cited, is the most favourable for such treatment; but I have, in the course of a week, successfully rotated a central incisor, attaching the rubber in this case to the opposite central and lateral. The chief feature in the foregoing method of treatment is, I apprehend, the facility with which a fixed point can be obtained for applying the traction, the means for which are to be found in every Surgery, and which are or should be within reach of the Dentist while at work.

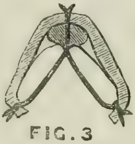


FIG. 3

Of its various applications I need not speak, as they will be obvious to most readers, and if any of the Profession deem the foregoing plan of any use in their *répertoire* of ways and means, I freely and fully invite them to place it there.

FRACTURE OF UPPER JAW.

By Stephen Hoole, L.D.S.Eng.

The following case is, I think, sufficiently unique in its character to interest the readers of the Dental Record. Mr. L., whilst on his magisterial duties in India, ten years ago, was thrown from his horse on to his face, the fall driving inwards *en masse* the portion of the upper jaw containing the four incisor teeth, by fracturing the anterior portion of the palate and the external alveolus. He rode back to the station and was attended by a surgeon, and after three months was able to eat solid food. On his consulting me eight years ago (two years after the accident), from the pinkish hue of the two centrals and their elongation, I advised him to avoid biting hard on the parts. Some years ago I made him a side piece of first molar, first bicuspid, and canine, the natural canine having become loose. A fortnight ago, whilst biting an apple, the whole of the bone originally fractured suddenly gave way, and is now simply kept in its place by the adherence of gums and edges of bone. The patient, having company staying in his house, was desirous of retaining the teeth until a more convenient time, and, after a consultation with Mr. Berkley Hill, he decided to wait. I have seen the patient to-day (January 24), he is free from pain, and has resolved to winter abroad, deferring the removal of the teeth and bone until his return, if not much inconvenienced. Should the fracture prove troublesome, he will return to England immediately for operation, when I shall communicate the result.

REPLANTATION OF TEETH.

A Clinical Lecture delivered at the National Dental Hospital,

By G. J. Williams, L.D.S.Eng.,
Dental Surgeon to the Hospital.

Gentlemen,—I wish to bring before your notice this morning a patient whom we operated upon twelve months since, that will show you a successful replantation of a tooth ; and, I may remark, it is seldom we have an authentic case that we can see so long after treatment. The replantation of teeth has been much discussed of late years, and opinions upon the procedure are divided. Many years have passed since Hunter proved that transplantation was possible by placing a tooth, recently extracted, in the comb of a cock ; and, feeding the animal upon madder for some time, then killing the bird and finding the tooth coloured the same as the bones of the animal. It is recorded that some seventy years ago poor persons having good front teeth were prevailed upon to part with them for a monetary consideration, that they might be transplanted into other mouths, the teeth of which were faulty ; but we have no reliable record of the success of the operation of late years. Where replantation of teeth has been done, it has been with a view of more successfully filling a cavity than could well be done whilst the tooth was in the mouth. The operation consists in the tooth having been carefully extracted and encircled in a damp piece of lint, the caries carefully removed, the cavities stopped, and the tooth, having been well washed in warm water, replaced in its socket and carefully tied to the two adjacent teeth. Some practitioners state that they are successful ; while others are not so sanguine. As regards my own observations, I cannot say that what I have seen could be considered as successful ; and I think longer time must expire between the operations and declaring the result than has usually been given, before success can safely be pronounced. For whilst the tooth may appear firm and satisfactory after a month or so, yet after six months or more the opinions would differ as to its success. During the early part of the time after the operation the patient has necessarily been careful not to use the tooth much, as pain ensued if bitten upon a great deal, although the tooth attains a certain amount of firmness and ceases to give pain. It is frequently not until some time after replantation that, if carefully noticed, a difference in colour between the replanted tooth and its fellows will be observed. A darker or blacker hue will be noticed, due to a want of nourishment and consequent death of the tooth. Where this takes place we can hardly call the operation successful, even if twelve months have elapsed since the operation; and few teeth which have been called successfully treated have been that length of time under notice.

I have seen a few teeth that have been so treated which, where any length of time has expired, have been more or less discoloured, a sure sign, I think, of ultimate failure. Of the operation itself, as regards the extraction of a decayed tooth with a view to stopping and replacing it in its socket, I candidly say I am not in favour of it. On the reasons I have given it is scarcely desirable, as being very doubtful in its success; but from other views it is not an operation I should advise, and if advised, I think I should find very few patients who would follow that advice. When a patient comes to you for treatment, it is generally with a view to save the torture of extraction, and to postpone that heroic treatment by stopping the tooth; and, if replanted, no positive assurance can be given that after much pain and inconvenience, a second extraction will not be required. As far as my experience goes, if a patient has once got rid of a troublesome member, he is in no hurry to have a repetition of the same description of suffering; and if the tooth has not been troublesome, but simply decayed, his visit to you is to get the tooth plugged, so as to prevent it becoming troublesome; but, in such case, to advise extraction as a primary move is, as I before remarked, heroic. I do not say no occasion may arise when it would be unwise not to do so, but, as a general rule, I think you will do best to perfect yourselves in filling the teeth whilst *in situ*, no matter how difficult the position of the cavity may be, for therein will lie your skill as pluggers of teeth.

There are occasions in which the replanting of teeth is not only desirable but imperative, and where success is most likely to ensue. It will sometimes occur where the first lower molar is decayed on its anterior third, that the remaining portion gets pushed forward by the molar teeth behind until the posterior part of the second bicuspid lies in the carious cavity of the molar, and the lower border of enamel will impinge immediately beneath the enamel of the bicuspid. To remove only the molar, unless the fangs are divided, or easily done so, is almost an impossibility; and upon the attempt to do so being made, the bicuspid, which is the easiest tooth to extract owing to the very tapering form of the fang, will spring out of its socket some little time before you get the molar away; and, when this accident does occur, by the immediate replacement of the bicuspid in its socket, if healthy, it will generally become a firm and useful member again, and keep its colour as though it had never been removed. If by any possibility such event occurs to any of you, at once replace the tooth, and entertain hope of good results.

The patient before us this morning has been treated somewhat in that way, and from the length of time that has passed since the operation was performed, I have thought it a good case to bring before your notice. On December 29th, 1880, the patient, a rather weakly, nervous girl, about 18 years of age, presented herself here for treatment. Her face was very much swollen, and great nervous prostration was visible. The history she gave was, that she had been to several places, the last being St. Bartholomew's Hospital, to have the stump of a tooth extracted. On each occasion they had all punished her very much, but had failed to give her relief or extract the offender. Upon examination of her mouth, as some of you may remember, great difficulty was experienced in opening it wide enough, owing to the swelling and pain it caused. A very crowded state of teeth was seen, the absence of the crown of the second lower bicuspid was noticed, the fang being found deep in the alveolus. The six-year-old molar had been forced over the fang and was very near the first lower bicuspid. Now it was evident that, until the fang of the second bicuspid was removed, that being the one which was causing the disturbance (the other teeth being sound), no relief could be found; and it was also evident that the fang could not be removed through the small opening above it, and it was the several attempts to do this that had so punished the patient to no avail. I deemed it desirable to first extract the first bicuspid, then remove the stump of the second bicuspid, replacing the first bicuspid in its place immediately; the whole operation, occupying some forty seconds. Directions were given to foment well the parts with warm poppy lotions, and the patient was sent away. If you examine the tooth now, being over twelve months since its replacement, you will find it firm, the same colour as its fellows, and likely to be amongst the last to be removed from its refound socket.

VALEDICTORY ADDRESS,

Delivered before the Students' Society of the National Dental Hospital and College, January 13,

By the retiring President—THOMAS GADDES.

GENTLEMEN,

When I took my seat in the Presidential Chair of this Society, it was my pleasure to make a few observations on the field and nature of the work which might not unprofitably engage the attention of members. Several of the subjects to which I then referred have formed themes of discussion among us during the past two years. Indeed, I may truthfully say, that there are but few questions related to Dental study and practice which have not, in some form or other, been brought before the Society during the time I have had the honour of presiding over your meetings. The period has, therefore, been a most successful one; and you, gentlemen, are to be congratulated on possessing such means as this Society affords of receiving and imparting information.

Many of the papers which were read were essentially practical, treating with items of every-day practice—as The Use of the Elevator; The Presence and Formation of Secondary Dentine; Sudden Emergencies; the never-dying subject of The Dental Pulp—its diseases, treatment, and the common effect of its death; Alveolar Abscess. Several other papers of equal interest were also submitted to the meetings. Nor were the discussions less profound, for the more theoretical members had opportunity and scope to air their very subtle opinions and hypotheses when the Society was entertained by a paper on the Evolution of Nerves. Mr. Coles favoured us with a paper on Clinical Teaching in Dental Hospitals, and that elicited from the students their views upon being taught, apart from a teacher's aspect of the question. The paper on Oral Secretions was a credit to the Society, and it will, I trust, excite emulation among our members.

Though the several papers read before the Society have been of a varied character, there is still abundance of virgin soil to be tilled; and fresh strata must ever and anon come to the view of the faithful student of that section of biological science which engages our attention. Original research and discovery are not alone interesting, though both in investigating, and also in recording the results of original work, there is incited within us enthusiasm and pride. But if we cultivate and use aright the faculty of observation, we shall have many subjects to write about. And while it is probable that the greater part of those subjects will not be absolutely new, yet they may be of such a nature, and be treated in a manner that a thesis may be instructive to many, and interesting to all. To prepare a paper necessitates the author reading up the text-books and writers upon the subject in hand, and in that way he becomes more fully acquainted with the literature of the question. The desire to excel also incites the student to become, as far as he can, master of his theme. In reading his paper, and in answering the questions which arise in the discussion, he assumes, in a sense, the position of a teacher; and I assure you, gentlemen, of the truthfulness of the adage—in teaching little you learn much.

The calling of the Dental Surgeon is almost entirely one devoted to the reparation of the ravages of disease; and that Dental diseases are increasing in prevalence is to be regarded not as a theory simply, but as a fact. In the several departments of Medicine progress is largely in the direction of preventative treatment. This is the outcome of a more perfect knowledge of the causes of disease; and to the recent investigations of M. Pasteur, mankind will ever be indebted. The treatment of Dental caries has long been discussed, and preventative treatment of it has frequently, particularly of late, been suggested. But, before a rational treatment of that nature can be formulated, we must first have a clear conception of the causes of Dental caries. Among what are termed the predisposing causes are structural defects. These and other causes are frequently hereditary, and must, therefore, according to the laws of heredity, be sought for in progenitors. Whatever of the causes of Dental caries is due to heredity, those special tendencies have been imparted to the physiological units: and the cause of those tendencies has acted, not during embryonic life simply, but, most probably, before the act of generation. If this be true, and the evidence indicates that it is, the induction points to the preventative treatment of Dental caries being exercised upon the betrothed. How is this to be done? Shall we find an agent, or a series of agents, which, by inoculation, will restore a more perfect animality? Shall we ever be able to convert a retrograde development into a progressive development, while most of the factors of the former are existing and incident? The preventative treatment of this disease during the embryonic and fœtal states and after birth, almost necessitates the possession by women of some amount of physiological knowledge. How frequently are women *enceinte* known to take very little food, and that little mere trash! yet they dream of bringing forth a "fine child"—a child which may almost exceed in weight more than the amount of food taken during the period of its breeding.

Dental Disease is but one manifestation of evil which abounds in Nature. But all diseases are not pervertions of nature's working; for the conditions of senility, and those many pathological conditions which not only tend to, but in reality do, thin the population of the earth, are likewise evidences of the working of those very concrete phenomena which we denominate Nature—a totality of forces optimists have regarded as benign. Nature to the individual is, in truth, very often a cruel mistress ; her ways are not ways of pleasantness, neither are the paths of peace. In nature there are abundant exhibitions of suffering or doing evil or pain, and good or pleasure following ; and in this, perhaps, comfort may be found for extracting an aching tooth. Consider, also, the pangs of parturition and the after maternal joy. Further exemplification attains in parasitic diseases, in the germ theory of disease, and in the universal truism—struggle for existence and survival of the fittest. The life-history of the common tape worm (*Tænia solium*) is an interesting example. A hermaphrodite animal without a mouth, taking nutrition by imbibition, and existing in the alimentary canal of a man, undergoes generative segmentation. The segments, each of which contains a fecundated ovum, are passed *per ano.* The ovum is liberated from the segment, and gaining access to the water or food of the pig, and being swallowed, the embryonic worm bores its way through the stomach, and becomes lodged in the muscles of the pig. If this flesh be eaten, the embryo will, in the intestines, develop into a tape worm, which, in its life career, is neither pleasant nor peaceful to either of its hosts. With the disease germs also, a similar parasitic principle exists. Life on the earth is not all that could be desired. There are ever some wants to be satisfied. If a man assert, not many can, that he is perfectly happy and contented, such happiness and contentment are only relative. Blissful ignorance ! Does not his soul thirst ? The greatest pleasure possible cannot be long sustained, or it is followed by exhaustion, and ceases to please. The animal requires food, so do the microscopic protoplasts. Indeed, life and equilibrium are incompatible. In working out the etiology of dental diseases, there should be recognised the part which nature plays. How many of the causes have their roots deeply implanted in the recondite agencies which, by their slow but sure working, are effecting in civilised man a retrogression of animal physique, most probably, too, a diminution in the power of producing large families, and, of a truth, a marked increase in cerebral development ? A true test of the civilisation of a nation is to be found in its progress in Science. The exercises necessary to this high cerebral integration have a correlative structural and functional disintegration of the physical organism.

From these few remarks relative to the merely natural aspect of one section of the several causes of the diseases which the Dental Surgeon has to treat, it will be apparent that he who, as a student of the science of Biology, sets before himself inquiry in that direction must, in the exercise of the highest intellectual powers which such research necessitates, be jealous of truth. Theory and hypotheses should never be elevated to its domain. All men are not endowed with equal powers, but the endeavour to improve is a noble effort. There are at all times few relatively great men, while the mediocre are abundant, and the host of wallowers is legion. Ever strive to attain the first rank; be charitable in thought; give reverence to earnestness, and, though the energies be rather directed from the good, recognise the noble principle of devotion. Love and maintain truth, for it is the final purpose of mind, and co-eternal with it.

In retiring from the Presidency of this Society, an office to which you have twice elected me, I beg to thank you for the honour which you have thus conferred upon me; also to thank the officers and members for the support they have given me, and the lively interest they have shown in the welfare of the Society. Though retiring from the Chair, yet, notwithstanding the further favour you have to night bestowed in electing me a Vice-President, you may rest assured of my continued devotion to advance the prosperity of this Society.

AMERICAN OPINION.

At a meeting of the First District Dental Society of the State of New York, on October 4th, a report of which appears in *Johnston's Dental Miscellany*, some of the American visitors to the Medical Congress expressed their opinions of what they had seen in England.

Dr. Atkinson said it afforded him great pleasure to stand before them that night, and he wished he had the ability to communicate to them the manifold experiences he had passed through since last he left them. It was a matter of astonishment to see how their (the Americans) names were known on the other side of the water. As far as kindness and hospitality were concerned nothing could be more complete or satisfactory than the manner in which they were treated in Europe; but to men who went there with the expectation of being advanced scientifically, if all their experience was the same as his was, that matter would have to turn up under the head of disappointment. They had a magnificant gathering of some three thousand members, that was actuated more rigidly by rules and regulations and old fogy methods than their American Associations laboured under. It would not do to compare that body for freedom with the American Medical Association, and could not for one moment compare with the American Dental Association, the highest body on the Continent for freedom of speech. It was not, however, a proper moment for him to go into details of that meeting in London. If one advanced any discovery that was beyond their day or in advance of their recognition they had in England a very smooth way of ignoring one. Those who had got a report of the proceedings of the body in London would be able to go through the details. They had some clinics there, but the best portion of their best men would not compare with the American fourth-rate man. Their best finishings were bad ; they were like the old finishings, and how so intelligent a body as the English public could put up with it was a marvel to him. In Surgery they had magnificent displays of old-fogyisms. They were as much behind as the Americans were thirty years ago. They had a very fair representation of Germans. They understood something about molecular change. But not an Englishman nor a Frenchman who opened his mouth could give one to understand that he knew anything about molecular change. The mass of the English dentists were just outside of the court circle. He referred to his reception by the President of the Odontological Society, of whom he spoke in very high terms, and next gave a disquisition upon the Tower of London. He did not see anything attractive in it, it being a relic of the murderous exercise of war.

DR. E. PARMLY BROWN said he was treated magnificently in London. They were not, in London, up to the mark in operative dentistry. They were not equal to the American dentists. They were twenty-five years behind the age in operative dentistry. They wanted in England, however, to learn, and if they had some good operators there they would soon learn. The American operators in London retrograded—they went back after being there some time. It required a good dentist indeed to go over there and go ahead of the prejudices of the country. The second day's clinic was the American dentists' clinic. The English dentists got very much interested in it. They were, in fact, surprised, and he would not be astonished if they had a lot of them over here to learn.

The Editor of the *Miscellany* says it would be well to remember that a week or two's residence in London would not give a man an opportunity to grasp all that the English know. In some directions they have gone a long way ahead, in others they have lagged. But then the Englishman who comes to New York for a visit, if he is an average man, sees only our bad streets, our gaunt telegraph poles and shabby docks. So if in our American dental journals for a year or two to come our English friends see an effervescence of disgust at their insular prejudices and conservatism, they must try to forgive us.

ODONTALGIA.

Edward H. Brown, D.D.S., communicates to the *American Journal of Dental Science* an article on Odontalgia, and relates the following incidents:—

At the battle of Brandy Station, in the civil war, was a trooper who had suffered several days with a toothache. In a hand to hand fight he received a pistol ball in the right cheek. It knocked out his aching molar, and passed out of the left hand corner of his mouth, taking along a part of an upper tooth. The joy of being rid of the toothache was so great, that the trooper could not be made to go to the rear to have his wound dressed.

On the 20th of May, 1879, the writer, by falling from a scaffolding, received a terrible fracture of both bones below the knee, the tibia and fibula. During the most painful part of the "knitting" process, the roots of the third left lower molar commenced to ache, and the pain was so great that he utterly forgot the pain of the fractured bones, and the intensely sensitive heel.

In the history of Rhode Island, we are told, that American Indians, were known to have been burned alive without a murmur of pain, but, nevertheless, would shriek with agony when suffering from the toothache.

Notwithstanding the [sometimes] terrible agony of toothache, people still hesitate to endure the momentary pain of extraction, and will often times suffer for years with diseased and aching teeth rather than submit to the operation.

FATALITY IN A DENTIST'S OFFICE.

W. F. Kelsey, D.D.S., communicates to *Johnston's Dental Miscellany* a remarkable instance of death, under the hands of a dentist, which occurred in Marseilles, on the 20th of October last:—

Gustavus Zach, a Swiss by birth, and about twenty-six years of age, called upon a dentist of that place for relief from the pain of an offending molar. An attempt, that appears to have been only partially successful, was made to remove the diseased organ. The shock of the operation produced a fainting fit of so alarming a character that a physician was called. After the application of the usual restoratives the patient revived and wished the operation continued. The physician and dentist both attempted to dissuade him from this determination, without avail, and preparations were accordingly made for the termination of the operation. His nervous apprehension was, however, so great that before the instrument could be introduced into his mouth he relapsed into a state of syncope, from which all efforts failed to revive him. As all attempts to again restore him to consciousness gave no promise of success he was removed to the hospital, where he shortly drew his final breath.

A post-mortem examination revealed the fact that death was the result of cerebral congestion, supposed to have been superinduced by the emotion attendant upon the operation. Some congestion of the lungs also existed.

DEVITALIZATION OF THE TOOTH-PULP.

EXPERIMENTS ON THE ACTION OF SOME AGENTS USED FOR THAT PURPOSE.

Dr. Joseph Arkövy, Buda-Pesth.

(From the Transactions of the International Medical Congress.)

The devitalization of the pulp being a daily occurrence in dental practice, it is necessary for the practitioner to be quite clear even about the minute effects of this sort of treatment.

A considerable number of papers on the subject may be found scattered in the periodicals, but the manuals of dental surgery only contain general remarks upon it. We search in vain in the empirical descriptions for an account of the pathological alterations produced by devitalizing agents, as well as for directions for their use, founded on a scientific basis. Perhaps the sole, and certainly the largest, monograph which has been written on the subject, is by Dr. A. Combe,* of Paris; but although attention is there directed to the mode of application of arsenious acid, the patho-histological details have not been made a subject of special inquiry.

These circumstances led me to commence a series of experiments on dogs, in order to elucidate, if possible, all the dubious questions which surround this subject.

Before giving an account of my experiments, we should consider the agents on the scale of the value of their applicability. I think, that every practitioner will agree with me in stating, that the ideal requirements to be expected of any pulp-devitalizing agent are—the easy application, sure, and if possible quick action, the least possible causation of pain, and no interference with the hard substances of the tooth. Now, we find only two agents which answer these expectations; arsenious acid and pepsinum.

It is rather curious, that both agents are, especially the former, hardly known as to their effects upon the elements of the organism;

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* Anthelme Combe, "De l'Acide Arsénieux dans ses Applications à la Thérapeutique de la Carie Dentaire," Paris, 1879, translat. *Brit. Journ. of Dent. Science* vol. xxiii. No. 207, and subsequent numbers, 1880.

and the investigations made in that direction (excluding the pretty old practical observations) are of the newest date. We will take a glance into them as far as they are serviceable to our subject. In 1879 Binz and Schultz* made experiments with arsenic from a chemical standpoint, the results of which show that, incorporated into the organism, arsenious acid changes into arsenic acid and *vice versâ;* both changes are executed by the protoplasmic tissue, and arise from the oscillation of oxygen atoms of the albumin-molecules; the quantity of these atoms deciding as to the therapeuetic or toxic action of arsenic. Under the influence of protoplasmic tissue a certain quantity of active oxygen becomes untied, and that is the real poison producing gangrenous destruction. That the arsenious acid has a special action upon the nerve centres is a well-known supposition; and we may add, after Ringer and Murrell's† experiments, that its action paralyzes the conducting power of nerves quicker than it stops the functions of muscles. Another not improbable statement is, that arsenious acid undergoes a chemical combination with hæmoglobin, as is shown by the spectrum, where we see only one of two oxyhæmoglobin lines.

Pepsinum has not until now been used much for devitalizing purposes, and has been limited to internal treatment. Once it has been mentioned for this purpose in one of the English dental journals —I cannot tell which and when—but it was not much adopted. Its action and the alterations produced by it in the tooth-pulp have not, as yet, been inquired into.

The experiments, which I now intend to communicate, bring, I believe, some light into the patho-histological details of the subject, and so, I think, they will be of interest for the profession.

There are questions which cannot escape the attention of a thinking dentist while applying devitalizing agents. The first of all is, the correct quantity to be used; the second is, what are the minute changes the pulp will undergo? a third question is, whether there is any chance of mischief possibly imposed by such an agent upon the dentine, enamel and cement? fourthly, in what light must we look upon consecutive periodontitis?

I have made experiments with arsenious acid as well as with pepsinum, in order to see the difference of their action, and so be able to state which might be the indications for one or the other.

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* Experimenteller Beitrag zum Verständmiss der Arsenwirkung von Binz and Schulz: *Centralblatt für medicinische Wissenschaften*, 1879, p. 17; and Die Arsengiftwirkungen vom chemischen Standpunkt betrachtet: *Archiv f. experim. Pathol. u. Pharmacol.* ix. 200.

† S. Ringer and W. Murrell: The Action of Arseniate of Soda and Arsenious Acid on Frogs: *Journal of Physiology*, i. p. 213.

The experiments have been executed in the pharmacological institution of the University of Buda-Pesth, on three dogs. The *modus operandi* was the following :—

I had an apparatus made for the fixation of the dog's head, the construction of which consists of a central iron ring divided into two portions, and provided with two screws and small leather-cushions to it, so as to keep the dog's nozzle fast, one serving to screw in the upper, the other the lower jaw. From the segment of the circle of the ring there are two branches extending to the maxillary articulation, so that, provided with iron joints, it may imitate the movements of the real jaw, and make it possible that by screwing open and closing a separate fixed screw on one side, shutting up at the other, not only the head of the dog will be fixed, but also all desirable dilatation of the mouth will be executable, without permitting the least contrary movement of the animal. To promote this object the dog receives a subcutaneous injection of three and a half cubic centimetres of tinct. opii. simpl.

In general, I used the trephines with an old White's engine to pierce through the sound enamel and dentine of the teeth—mostly the canines, third incisors and first molars, and always at the gingival margin. When the hole was sufficiently large, the thin dentin-layer was drilled out too, and either arsenious acid or pepsinum suspended on a few wet threads of cotton-wool, twisted round a pointed instrument, was brought into contact with the surface of the tooth-pulp. After this, the cavity was stopped with Hill's stopping, and this was again washed with chloroform in order to prevent any escape of the agent and intrusion of saliva.

All this was executed with the greatest accuracy. The quantity of each agent was correctly weighed in advance, the smallest amount having been one milligramme, the greatest not exceeding five milligrammes. The arsenious acid I used was of the porcelain quality, and powdered; the pepsinum was the best German preparation. These agents remained for from twenty-four to twenty-six hours in the teeth.

In one instance—viz., in the experiment with the third dog, I inquired into the effect of these agents, without bringing them into direct contact with the pulp. Here only a thin lamella of dentine was left to occlude the pulp-chamber, just so thin as to let the red translucent pulp be seen. At the lapse of the above-named time the dogs were killed by prussic acid (acidum hydrocyanicum) and the teeth which had been operated upon were cut out, together with their bony connections, the agent was at once taken out of the cavities, and they were then put into a solution of alcohol, water, and glycerine

(2 : 1 : 2) in order that the preparations might not change even in colour.

The statements resulting from the naked eye and microscopical examinations are put down in the following tables. (Pp. 66-7-8.)

Now, if we gather and confront the facts which are contained in those tables, we may get, I believe, some valuable account of the mode of action of these agents.

The first change which we see is the more or less injected state of the pulp; the former in specimens treated with As_2O_3, the latter with pepsinum. The injection of the apical end of the root-pulp, as a sign of inflammation or affection in general, is specially apt to follow action of As_2O_3, while that of pepsinum does not go so far, except when the greatest quantity (5 mgrm.) is applied, and even then the effect is rather molecular detritus and collapse of tissue. The injection in the two instances, arises from different causes; in the arsenious acid case we see capillary emboli at the apical root-pulp—and that is even produced by 1 mgrm. of As_2O_3—and consequent plugging of blood-vessels; farther on we see that a surprising change takes place in the blood-corpuscles—viz., they become very pale or quite discoloured, owing to the special action of As_2O_3 on blood in general—as quoted in the introductory remarks—which probably consists in a chemical combination of it with hæmoglobin. We see the contrary with pepsinum; the blood-corpuscles in the vessels do not diffuse their pigment into the tissue, and are darker red than normal; this, again, may be ascribed to the hygroscopic nature of pepsinum, in consequence of which the water is drawn out, and the hæmatin and hæmoglobin remaining, exhibit their more intense colour. So, in both instances, the action of the agents is directly upon the blood, and must naturally interfere with the circulation and nutrition of the pulp. Another proof that As_2O_3, incorporated into the pulp remains there either in form of As_2O_3 or H_3AsO_4, is that thin sections of such a pulp exhibit on a china disc, held over a flame, the characteristic black soot; and the conclusion to be taken therefrom is, that in a longer space of time its action would extend over the limit aimed at. Arsenious acid has a special action on the tissue as well, inasmuch as it enlarges the cells of connective tissue considerably (from 3 to 4 times), and while it acts in the same way upon the nuclei of the neurilemma, the myelin becomes granular. There still remains a question, however, as to the mode of action of arsen. trioxyd. on the nerve fibres, as to whether we may ascribe this and the more surprising alteration, which I shall later remark upon, to the primary lesion in general imposed upon the pulp. Whatever opinion we may form on this matter, it is a fact that, beginning from 3—5 mgrms., a certain number of nerve fibres become granular in their interior

The same action can be observed on blood-vessels, in specimens treated with from 3—5 mgrms.; their contents are granular detritus and the vessels are, to a large extent, collapsed.

Pepsinum even in small, and specially in greater, doses (3—4—5 mgrms.), has a singular mode of action, as it produces a more or less defined demarcational line, leaving the end of the pulp really unchanged; and this circumstance may be of value in the discernment of the quantity which should be applied. As opposed to arsenious acid it is remarkable that the latter, in no instance, produces demarcation; and while we see every point of the action of pepsinum in changing blood, in forming a demarcational line and in producing —and that is the essential of its action—a kind of fatty degeneration in capillaries and larger blood-vessels, as well as changing the living into coagulated albumen, the action of arsenious acid is not so striking at the first glance; inasmuch as the destruction of the tissue is not so plain but is more extensive. Another question we wanted to have lighted up, concerned the periodontium. In that respect, I think, nothing will be more significant in deciding as to the degree of affection than the condition of the apical end of the root-pulp. In every case in which this point remained entire or unchanged, there will be no probability of the action having extended to the peridental membrane. We have practical reason to avoid the latter, and yet to desire that the action of the agent should include that end point of the pulp. Our agents act in a totally different way in that respect; and while we see a very slight injection already in the first (*A*) case after 1 mgrm. of As_2O_3 and see the same repeated in the following (*D*, *G*) cases in ascending degrees, we cannot find the action to this extent in the pepsinum cases, where the peridental membrane exhibited no alteration until after the application of 5 mgrm. (*H*.) In the arsenious acid cases we find, in every instance, a certain degree of affection of the last (apical) one-third or one-fourth of the pulp. On the contrary, in the pepsin cases this part always remained unaltered, with the exception of the last (*H*) case. Now, the conclusion will thus be obvious that As_2O_3 is more liable to produce periodontitis that pepsinum. Still, a certain part of the value of that statement remains an open question—viz., whether the apical part of the root-pulp will still be made insensible if left unaltered, and beyond the demarcational line. I believe that the quick progress of fatty degeneration, which invades the nerve-fibres, gives support to the proposition, that the sensibility is at least degraded. On the other hand, As_2O_3 gives evidence that its action very quickly reaches the peridental membrane. This latter question has found different explanations. Dr. Cruet (as quoted by Combe, *op. cit.* p. 50), ascribes the periodontitis, in such cases, to the increase of collateral circulation, EXPERIMENT (on May 29) YELLOWISH-BROWN DOG, ABOUT $3\frac{1}{2}$ YEARS OLD.

TOOTH.	Milli-gramm.		EXTERNAL EXAMINATION: PART OF THE TOOTH AT THE—			MICROSCOPICAL EXAMINATION: PART OF THE TOOTH-PULP AT THE—			SPECIAL REMARKS.
	As_2O_3	Pep-sinum.	Drill-hole.	Crown.	Root.	Drill-hole.	Crown-pulp.	Root-pulp.	
Left upper incisor. I. and II. (A.)	1	...	No alteration in dentine and enamel, either on long or cross sections.	...	Apical one-third of peri-dental membrane slightly injected.	No special destruction; nerve fibres normal; the blood-corpuscles in the blood-vessels are to a certain extent a granular detritus.	Diffuse blood pigmentation.	At the apical part moderate blood extravasations, which seem to be caused by capillary embolisms, as seen in several instances.	
Right upper incisor. I. and II. (B).	...	1	Pinkish brown.	Pinkish hue.	Apical two-thirds normal.	Resembling clotted albumen close to the drill-hole, while on the opposite side even the layer of odontoblasts intact.	...	No embolisms.	The I. incisor differs from the II., inasmuch as here the apical end of the root-pulp is injected, while it is quite pale at the drill-hole. In general the pulp in this instance seems to be less affected than in the former case.

EXPERIMENT (on June 6) BLACK DOG, 3 YEARS OLD.

TOOTH.	As_2O_3	Pep-sinum.	Drill-hole.	Crown.	Root.	Drill-hole.	Crown-pulp.	Root-pulp.	SPECIAL REMARKS.
Right upper canine. (C.)	2	...	Normal.	Brownish red (pulp).	Apical one-fourth of root-pulp brownish red.	...		The dentinal tubes show no change whatever; but the fibrils in several instances seem to be in a state of granular tumefaction at the tinged apical portion.	Sections of the pulp put upon a china dish, and held over the spirit-flame, leave a dark black dust (characteristic of arsen.), while pulp-particles (normal) become in the same process only dry and brown.
Right upper incisor. III. (D.)	3	...	Normal.	Slightly reddened dentine.	Brightly, reddened dentine and cementum	Immediately under the drill-hole, cells of connective tissue enlarged: intumescence of the nuclei of neurilemma; in the axial part of nerves the axis-cylinders almost disappeared, and in some places replaced by granular contents. Blood-vessels normal, rather anæmic.	Apical one-third; blood-vessels teleangiectatic; one-fourth to one-sixth of their normal size.	...	The whole pulp-tissue in general is scattered with arsen. molecutes. It is a very remarkable circumstance, that while pulp-tissue *in toto* is suffused by blood pigment, the blood-corpuscles in the interior of the vessels are bereft of their pigment, and so point to the suggestion that the arsen. molecules form a chemical combination with the hæmoglobin of the blood-corpuscles.

Left upper canine. (E.)	..	4	Hard substances show no alteration; pulp in general considerably injected, especially the upper three-fourths; hence, to the apex no change at all.			Granular detritus and considerable destruction, where micrococci may be seen (probably from the agent itself); dentine not changed.	...	At the demarcational line the blood-vessels expanded to four or five times the normal size; however. the blood-corpuscles did not lose their pigment; on the contrary, where they are crowded, they form purple spots. Under the demarcational line the vessels are bloodless and shrunken	At the last one-fourth of the root-pulp a demarcational line is to be seen, consisting of black-looking, clotted blood, running all round the body of it; the pulp is, under that line, collapsed, and does not fill up the root canal. In the whole pulp the nerve-fibres exhibit no alteration.
Left upper incisor. III. (F.)	...	4	Alteration confined to one-fourth in its middle; dark red; injected.	Upper, and, to a certain extent, also at the lower end of that part a demarcational line.		Blood-vessels expanded, and full of their contents; pepsin molecules spread over it.	...	...	Some of the capillaries at the affected part contain in excess pepsin grains, and only very few blood-corpuscles.
				Proper crown pulp unaltered.	Ditto.				
Left upper molar. I. (G.)	5	...	...	In the pulp chamber 1-2 mgrmm. of excess of arsen.	Peridental membrane considerably injected on two of the roots; one is specially affected, and even the dentine and cement is brownish-red from the drill-hole to the apex. No normal part on the whole tooth.	Dentine seems to be normal; arsen. particles not able to invade the tubes; fibrils unaltered. Pulp tissue; enlarged cells, blood-corpuscles (as above).	Hardly any change; only in a few capillaries blood-corpuscles in detritus.	Three millimetres under the drill-hole, and especially at the apical end, ecchymosis in high degree. The vessels contain arsen-molecules, and are partly collapsed. Some of the vessels form an exception. Immediately under the drill-hole the protoplasm, as well as the nuclei of the connective-tissue cells, are remarkably enlarged, about three or four times the normal size.	In general, in this specimen the blood-corpuscles are disintegrated into granular detritus; and we get the impression that such masses produce embolism, and not organised thrombosis; and hence the plugging of the apical vessels. The myelin of the nerve-fibres is granular. In other places the nuclei of the neurilemma are enlarged. The granulation does not look like fatty degeneration. These changes occur mixed with integral tissue. It is curious and highly interesting that, in the least affected and most peripheral crown-pulp, we find some nerve-fibres with single and double contour, where the axis-cylinder exhibits notches of oval shape. They are sometimes close and sometimes at some distance from one another. These are to be looked upon as tumefactions of the axis-cylinder. Yet it is singular that the neurilemma does not proportionately expand, answering to the enlargement of the tumefied parts.

EXPERIMENT (on May 29) YELLOWISH-BROWN DOG, ABOUT $3\frac{1}{2}$ YEARS OLD.

TOOTH.	Milli-gramm.		EXTERNAL EXAMINATION: PART OF THE TOOTH AT THE—			MICROSCOPICAL EXAMINATION. PART OF THE TOOTH-PULP AT THE—			SPECIAL REMARKS.
	As_2O_3	Pep-sinum.	Drill-hole.	Crown.	Root.	Drill-hole.	Crown-pulp.	Root.pulp.	
Right upper molar. II. (H.)	...	5	Two-thirds in the middle of the pulp collapsed; brownish red, brittle.	Pulp slightly injected; dentine close to the pulp moderately pigmented.	Peridental membrane moderately injected; apical one-third; slightly altered	Hyperæmia; blood-vessels extraordinarily dark red. The periphery of the pulp is totally destroyed, resembling coagulated albumen, while its axial part did not much suffer.	Much detritus; here and there unaltered tissue.	The upper part presents an aspect of almost total destruction, with detritus, and in the greater blood-vessels crowds of fatty-molecules may be observed. In general the whole axial part of the root-pulp is in a state of congulation and fatty detritus: nerve-fibres partake in the latter. The peripherical part of the root-pulp hardly underwent any change.	The dark red colour (the contrary of which we find in specimens treated with arsenic) insinuates the supposition that pepsinum removes chemically the water of the blood-corpuscles, and only the blood-pigments remain in the vessels.
EXPERIMENT (on July 3) BLACK DOG, 11 YEARS OLD. (Agents not in direct contact with the pulp, but only separated by a thin lamella of dentine. Section after three days.)									
Right upper incisor. III.	1	...	No change whatever.				...	...	...
Right upper canine.	5	...	Slight injection.	Considerably injected.	No change.	Dentinal tubes; diameter greater.	Great quantity of fat globulen scattered throughout the right top of the crown-pulp.	No alteration.	The animal having been very young, the greater diameter of the dentinal tubes is to be ascribed to that circumstance; at the same time, this seems to give also an explanation of the real cause of the injection. An additional cause of this may be the irritation of the foreign body and the drill-hole. The fatty aspect of the crown-pulp is not accompanied with any noteworthy trace of real fatty degeneration, either of the nerves or of the blood vessels.
Left upper incisor. III.	...	1	...	...	...	...	...	...	...
Left upper canine.	...	5	...	Vehement injection.	...	Vehement injection: blood-vessels expanded; no other change.		...	...

An additional experiment has been made with dentine—taken from the three-year old dog—which has been put in one watchglass full of soft water and five milligrammes of arsen. trioxyd.; and the same has been tried with the same quantity of pepsinum. After three days the microscopical examination showed the following: In the first instance (As_2O_3) neither the intertubular substance nor the tubuli underwent any change; not so the dentinal fibrils, which exhibited—in a few places—longitudinal notches or tumefactions. The specimens in the solution of pepsinum I have found to be devoid of fibrils; but there was a noteworthy fact—viz., the preparation was covered by a great number of mycelium-threads and innumerabble very light grains, probably spores of the fungi.

produced by the suppression of the same in the interior of the pulp Dr. Combe, in his own opinion, rather attributes this effect to the influence of arsenic in general. On the ground of our introductory remarks, this inflammation must be due to *chemical changes* produced by arsen. trioxyd. in the elements of blood and protoplasmic tissue in general, and for this affection we shall find evidences also in our columns, from which we learn, that particles of As_2O_3 are taken up into the blood-vessels, and carried towards the apex, &c.

The consequences produced by arsen. trioxyd. if left for a longer space of time within the pulp, may, on that account, be considered as critical for the existence of the tooth as well as for the health of the socket, and even the body of the maxillary bone. Therefore, the total extirpation of the pulp, after such an application, must in due time be considered as absolutely essential.

Now, if we again direct our attention to the patho-histological changes of the nerve-elements, there we find a most singular alteration of the axis-cylinder. This consisted in the notchy tumefaction of the axis-cylinder. The notches were partly close, and again at some distance from one another; they were dark, and looked to be of homogeneous matter—not granular. The neurilemma was not proportionately widened, to correspond with the notches. How was this to be interpreted? I soon found the patho-histological fact mentioned in Professor Charcot's "Leçons sur les Maladies du Système nerveux."* Charcot, and before him a few authors, have observed that tumefaction of the axis-cylinder. Heinrich Müller was the first to recognize this in the fibres of the retina, associated with fatty degeneration of the connective tissue and blood-vessels, in cases of nephritis albuminosa (*Arch. f. Ophthalmologie*, iv.). Afterwards Zenker, Virchow, Schweitzer, Nagel, and Hadlich had occasion to describe similar observations, and Charcot, of his own account, in cases of myelitis. All the cases which have been published on the subject are limited to diseases and traumatic conditions of the brain and spinal cord; the only one exception being the retina. This circumstance seems to me to attribute to these observations a certain importance, inasmuch as the same patho-histological alteration in our case is stated to exist also at the most peripheral point of one nerve—viz., that of the tooth-pulp.

Whatever the right significance of this affection of the axis-cylinder may be—this being to-day an open question—we can only consider it as an inexplicable fact, and an essential alteration in the texture and physiological function of the nerve fibres, which may be looked upon as a primary change, caused by the foreign body, either mechanically or by its chemical action.

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*Tome ii. 3me éd. Paris 1880. Appendice iii. Sur la tuméfaction des cellules nerveuses motrices, et des cylindres d'axe des tubes nerveux dans certains cas de myélite."

RESULT OF THE EXPERIMENTS.

Theoretical Part.

Arsenious Acid.—I. As_2O_3 brought into contact with the tooth-pulp acts in the following way: a certain degree of inflammatory hyperæmia, total or partial, depending upon the quantity of the agent applied, sets in; the blood-vessels become expanded (3—4 times), of regular diameter, and here have a tendency to thrombosis. This latter effect may also be in connection with embolism of the capillaries, when the agent is quickly taken up into the blood-vessels.

II. As_2O_3 produces no coagulation of tissue whatever.

III. It has a specific influence upon the blood corpuscles, combining with the hæmoglobin to form a compound of arsen-hæmoglobin, and of this chemical process there seems to be evidence in the diffuse yellowish tinge of the whole pulp tissue, and in the discoloration of blood in several of the blood-vessels.

IV. In nearly every case it is taken up in substantia (in form of molecules) into the blood-ways; when there it produces, besides the above-mentioned changes, granular detritus of their contents and anæmic collapse, shrinkage—the latter effect being brought about nearly exclusively in cases where greater doses were used.

V. The bulk of the pulp tissue—viz., connective fibres and odontoblasts—undergoes no change whatever; not so the connective tissue cells, which increase 3—4 times their normal size.

VI. The special action of arsen. trioxyd. upon the nerve elements consists in the following: the neurilemma is only so far influenced that its nuclei are somewhat increased; a more essential change takes place in the axial part, where, after the application of more than one mgrm., granular detritus of myelin sets in, and the axis-cylinder commences here and there to disappear.

As a very surprising alteration, may be regarded the notchy tumefaction of the axis-cylinder, described heretofore almost only in cases of central lesions.

VII. All these alterations occur in and amongst normal looking tissue.

VIII. The action of arsen. trioxyd. is microscopically exhibited by a brownish-red tinging of the whole or of certain parts of the pulp body, as well as of the neighbouring dentine and cementum—this latter in cases treated with greater doses—viz., 2—5 mgrm. This alteration is most expressed at the top of the crown pulp, and at the apical ¼-⅓ part. This circumstance may be considered as an external evidence of the devitalization being completely attained to.

IX. The conditions of the affection of the peridental membrane should be regarded as standing in connection with the degree of the above-named (VIII.) alteration, which again depends upon the quantity used, and the space of time during which it was left in contact. The smallest quantity (1 mgrm.) is able to produce a slight degree of injection.

X. Arsen. trioxyd. if not brought into direct contact with the pulp—viz., when a thin wall of dentine lies between, does not produce any of the alterations before mentioned even in cases where 5 mgrms. are used. The inflammation produced in the experiment can only be looked upon as a product of the irritation of a foreign body put close to the pulp, and endowed with different conducting power for heat and cold.

XI. As_2O_3 seems not to have any action upon the dentine; although if left for a longer space of time under its influence, a slight tumefaction of some of the dentinal fibrils can be seen, while the hard substances do not alter at all.

Pepsinum.—I. The action of pepsinum upon the pulp tissue is quite different from As_2O_3—viz., greater doses (about 4—5 mgrms.) produce well-defined coagulation of the albumin; but intruded into the body of the pulp a circumscribed coagulation may be produced even by 1 mgrm.

II. This coagulation, when greater doses are used, may extend beyond the place of application, and reach as far as the apical end of the root-pulp.

The details of its action consist in the following changes:—

III. Close to the spot of application an injection sets in, inducing the same at the crown-pulp. At a certain distance from the drill-hole (= carious cavity), the inflammatory redness turns suddenly dark and forms a demarcational line, designating the limit of the action; hence the apical ⅔, ⅓, ¼ of the root-pulp—depending on the doses—is unaltered; the action is total only in cases where as much as 5 mgrms. are applied, and consists in the above-mentioned destruction.

IV. The blood-vessels become to a certain degree expanded, and their contents do not lose their pigment; on the contrary, the blood corpuscles exhibit a deeper tint, which approaches to purple-red. This change may find its explanation in the great hygroscopic power of pepsinum, inasmuch as by this way the water of the blood corpuscles is drawn out, and their pigment remains in a state of abnormal concentration. This very effect is also an evidence that the vascular disturbance is to be attributed to the same cause. So far as the quantity of pepsinum suffices for that purpose, so far its action will go. Therefore—

V. It is more probable that, if in such cases peridental inflammation ensues, this will be rather attributable to, and considered as, collateral hyperæmia. On the other hand, it does not seem probable that the disintegrating action of pepsinum should be able to extend over the aperture of the root canal.

VI. Greater doses (4—5 mgrms.) of pepsinum produce essential alterations in blood-vessels as well as in nerve-fibres. The former in their continuity become collapsed, or anæmia, together with fatty degeneration, commences to set in. The nerve-fibres undergo fatty degeneration only when as much as 5 mgrms. are applied.

VII. Pepsinum, when not in close contact with the pulp—viz., through a lamella of dentine--produces no effect at all.

VIII. The hard substances if left for several days in a solution of pepsinum do not alter; only, perhaps, the dentinal fibres disappear, but the dentine gets covered with mycelium threads and spores of fungi.

[An investigation into the peridental membrane, and into the maxillary arteries, as well as the corresponding branches of nerves in the maxillary canal, could not be executed in the animals, because with the teeth of dogs it is impossible to peel off the alveolar wall and preserve the integrity of those parts, as would be required for such an inquiry.]

Practical Part.

Arsenious acid and pepsinum being essentially different in action, the conditions of their application must also be conducted in a different way.

I. Neither of the agents has a devitalizing influence upon the pulp capable of extending through the dentine; they must be used so as to be in contact with its surface.

II. The quantities of the agents which would produce an insensible pulp are different, and the selection decides upon the quantity to be used; at the same time the size of the individual pulp must also be taken into account.

III. The smallest quantity to be used of arsenious acid is 1 mgrm. The greatest dose should not exceed 3 mgrms.

IV. The length of time arsen. trioxyd. must rest with the pulp should never exceed twenty-four hours, supposing that a quantity corresponding to the size of the pulp has been chosen.

V. A dose of arsen. trioxyd. even only from 1—2 mgrms. left longer than twenty-four hours with the pulp, may produce periodontitis; and if still longer, osteitis, periostitis, and diffuse inflammation of the surrounding soft parts may follow.

VI. The swallowing of arsenious acid in such a quantity is not likely to produce any discomfort to the patient; the smallest poisonous quantity being 1 centigramme; still care must be taken not to bring it into contact with the gum, &c.

VII. Pepsinum produces remarkable alterations only if a greater quantity of it be used, supposing this be intended to remain for twenty-four hours. If left for a longer space of time, for instance, 2—3 days, then even 2—3 mgrms. will do their duty. For 24 hours, not less than 4—5 mgrms. will have a destructive effect.

VIII. The smallest quantity (1 mgrm.) of arsen. trioxyd. is more efficacious in producing periodontitis in twenty-four hours, therefore, than 3—4 times the quantity of pepsinum.

IX. It would be advisable to use this agent in every case where rapidity is not essential. Special indications for its use would occur (1) in teeth of very young persons where a large aperture of the root canal may be supposed; (2) in persons who do not keep quiet, in whom a correct application of As_2O_3 would be disturbed; (3) in teeth with distal cavities where the margin of the cavity is under the level of the gum; (4) if the patient wants to interrupt the operation for 2—3 days.

X. Either of the agents having been used, the total extirpation of the pulp must follow in due time. If this is omitted periodontitis will result, in arsenious acid cases sooner, in pepsin cases later. In the first instance directly by the chemical action of the agent, in the second, partly directly by the agent but principally by the fungi, which develop after a certain space of time, beginning from three days.

XI. The supposed effect of arsen. trioxyd. upon the odontoblast layer, producing secondary dentine, does not seem to be well founded, inasmuch as oxygen or hydrogen is indispensably necessary for its occurrence coming into action at all—and being put between a lamella of dentine, and the obturating material (as gutta-percha, &c.) these conditions are hardly bestowed. It is more likely that break of continuity itself and additional irritation from any obdurating material would produce that effect.

GENERAL MEDICAL COUNCIL.

EXECUTIVE COMMITTEE.

A MEETING of the Executive Committee was held on January 6th, when the following letter was read from the Dental Department of the University of Pennsylvania :—

"Office of Secretary,
"1533, Locust Street, Philadelphia,
"*November* 2, 1881.

"DEAR SIR,—I have this day mailed to you a copy of the last annual announcement of the Department of Dentistry of the University of Pennsylvania, which you are respectfully requested to examine and bring before the General Medical Council.

"The curriculum of this department is now at least fully equal to those of the other Universities having Dental Schools. An entrance or preliminary examination is required, or, in lieu thereof, evidence that the candidate for matriculation has received a collegiate degree, graduated at a recognised college or high school, or satisfactory evidence that he has successfully passed an examination in the required branches before a duly organised County Dental Society, having instituted a preliminary examination.

"The candidate for the degree must attend two full (graded) courses and fulfil all the requirements of the first and second years' studies, as set forth in the announcement.

"The examinations are oral and practical, and include actual operations and specimens of mechanical dentistry. In practical chemistry the student is required to work out his reactions by equations on the black board, and his standing in that branch depends much upon the progress he makes in the chemical laboratory.

"The final examinations are conducted by the faculty, but a majority (4) are also members of the medical faculty, and receive stated salaries, for which they are not in the least dependent upon the Dental department.

"There is no standard prescribed by our Legislature for the colleges, and it seems to be impossible to obtain any unanimity of action between them. In all the segregated Dental Schools the entire faculties participate directly in the profits derived from students' fees, hence they will do nothing which is likely to reduce the number of students. Legally, their diplomas have the same value as our own; in public opinion, however, the case is different; but as there are many young men who care only for the diploma, any step in the direction of a higher standard has the effect of increasing the size of the classes of the nonconforming schools. The adoption of a matriculation examination by this department has had the effect of reducing our first-year class fully one-third; its quality is, however, better, and the trustees are determined to do everything that will tend to render the Dental department capable of affording the most thorough Dental education, and in the next session the terms will probably be lengthened. The position which the Dental department of the University of Pennsylvania occupies in the United States is in no degree inferior to that of Harvard or Ann Arbor, and we therefore feel that we are entitled to be classed by the General Medical Council of Great Britain with those two schools, and I am therefore authorised to request you to bring the matter before the Council at an early date.

"Very respectfully yours,
"CHARLES J. ESSIG,
"*Secretary.*

"W. J. C. Miller, Esq., *Registrar*."

A rough analysis, made by the Registrar, of the documents submitted on the part of the University of Pennsylvania, is exhibited in the following tabular statement, in comparison with bodies already recognised :—

Licensing Bodies.	Preliminary Examination.	Duration of Professional Studies.	Sessions or Courses of Lectures.	Dental Hospital Practice.	Private Instruction.
Colleges in United Kingdom.	By authorised bodies.	4 years.	Two Winter and two Summer Sessions.	Two whole years.	3 years.
Harvard University.	.. ...	3 years.	Two Courses of Lectures.		
University of Michigan.	... ...	3 years.			
University of Pennsylvania.	(1) A brief Essay, not exceeding a page of foolscap, to test Grammar and Spelling; and (2) Examination in Elementary Principles of Physics, as contained in Fowne's Chemistry; or a degree, &c., &c.	2 years.	Two Courses of Lectures, the last of 5 months at this school.	... ...	Two years, inclusive of College Sessions, or, in place of private pupilage, the Spring and Summer Sessions of this College.

The Committee resolved that, as the course of the University of Pennsylvania does not come up to the requirements of the Council, the request be not allowed.

The following communications were read from the Royal Colleges of Surgeons of England and Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, in reply to the questions of Professor Turner's letter which is published on page 35 :—

FROM THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

"Lincoln's Inn Fields, W.C.,
"22nd day of *December*, 1881.

"SIR,—I have submitted to the Council of the College your letter of the 22nd ultimo, forwarding a copy of a letter from Professor Turner in reference to Dental Students, and a copy of a resolution thereon of the Executive Committee of the General Medical Council, and requesting that the Council will favour the Executive Committee with their opinion thereon, and I am desired to reply thereto as follows: First, in respect of the questions raised in Professor Turner's letter under the head (*a*); and, secondly, in reference to the resolution of the Executive Committee under the head (B) viz.:—

"(*a*) Professor Turner's questions.

"(1) That the four years curriculum for a Dental Student required by the regulations of the College includes apprenticeship.

"(2). That the three years' instruction in Mechanical Dentistry required by paragraph 9 of the College Regulations can be taken concurrently with the other parts of the curriculum, and be included in the four years, but not in any case before the passing of the necessary Preliminary Examination.

"(3) That, in the opinion of the Council, it is not necessary to more precisely define the expression 'four years in professional studies,' as, from the College Regulations, it is believed that Candidates for the Dental Diploma clearly understand that the whole curriculum of professional study can be completed within the four years; that the expression 'four years' does not mean (*a*) 'four years in a Dental School and Hospital'; that one year of apprenticeship (*b*) does count as one of the four years; and that two years passed as a Mechanical Dentist (*c*) do count as two of the four years, as it will be seen, on reference to paragraphs 3, 4, 5, 6, 7, 8, 10 of the College Regulations, that the rest of the curriculum can be completed in two years.

"(4) That the time spent under (*b*) and (*c*) cannot, by the College Regulations, be considered as a legitimate portion of the specified four years, if spent before passing the Preliminary Examination in Arts, for, as has already been stated in answer to Question 2, in no case can any part of the curriculum be taken out before passing the Preliminary Examination.

"(B) The Resolution of the Executive Committee:—

"That the Council cannot consent to admit to examination under conditions more or less exceptional, candidates who have commenced the study of dentistry since the 8th of September, 1859, inasmuch as the curriculum of professional education laid down in the College Regulations has been for many years in force, and has been required hitherto of all candidates excepting those who either had commenced the study of dentistry or had been in practice as dentists before the above-mentioned date.

"I am, Sir, your obedient servant,
"EDWARD TRIMMER,
"*Secretary.*

"W. J. C. Miller, Esq."

FROM THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

"The Royal College of Surgeons having received a communication from the Medical Council relative to certain points in connection with the Dental Curriculum and Examinations, as well as in respect to Clause 37 of the Dental Act, the President's Council, along with the Dental Examining Board, met for its consideration, when it was resolved that the following reply should be sent to the Medical Council:—

"The principal questions submitted for the opinion of the College seem to be as follows:—

"(1) What constitutes 'a year' of professional study?

"(2) Whether an apprenticeship, general or merely mechanical, and current during such a year, should be counted as professional study?

"(3) Whether the three years' mechanical instruction in dentistry, required by the curriculum, may be taken *before* or must be taken *after* passing the Preliminary Examination?

"In reference to these questions the College has to submit,—

"(1) That 'a year' of professional study means a Winter and a Summer Session spent—*subsequently* to the Preliminary Examination—in following out such subjects as are prescribed in the Medical Council's tabular curriculum of March 26th, 1879.

"(2) That such a year may be filled up by an apprenticeship or by a period of instruction in mechanical dentistry—always provided such apprenticeship or period of instruction be *subsequent* to passing the Preliminary Examination and in accordance with the prescribed curriculum.

"(3) That the prescribed period of three years' instruction in mechanical dentistry, as specified in the curriculum, ought to be allowed to be taken at the option of the candidate, either *before* or *after* the Preliminary Examination. But if taken before the Preliminary Examination it should not be allowed to count as any portion of the four years' professional study, or among the professional studies subservient for filling up these four years. At the same time the certificate of such three years *extramural* instruction should in itself be valid, whether counting as such professional study or not.

"In reference to Clause 37 of the Dentists' Act, and to the question of admitting to the Dentists' Register and to Examinations candidates whose apprenticeship terminated before January, 1880, this would appear capable of being more easily arranged were the *commencement* instead of the *termination* of such apprenticeships made the ground of admissibility. In this way the longer apprenticeship would not be placed at a disadvantage to the shorter one, supposing both to commence at the same time, and only the shorter one to terminate by 1880. The difficulty might be met by admitting to the Register and to Examination *sine curriculo* all those whose apprenticeship began before 1875. The *sine curriculo* Examinations, however, to be in all respects the same as for *curriculum* candidates, with the exception that no Preliminary Examination should be required. Signed in name and by appointment of the Royal College,

"JAMES ROBERTSON,
Secretary.

"Edinburgh, *December* 15, 1881."

FROM THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

"26*th December*, 1881.

"SIR,—Referring to your communication of 22nd November ultimo, I am instructed to inform you that the Council of the Faculty are of opinion,—

"(1) That Dental Students should be engaged in acquiring professional knowledge for a period of four years subsequent to Registration.

"(2) That of this period apprenticeship or employment in the work of Mechanical Dentistry may count for *one year*.

"(3) That of the three years to be spent in acquiring a knowledge of Mechanical Dentistry, the entire may be spent antecedent to Registration.

"Yours truly,
"ALEXANDER DUNCAN,
"*Secretary.*

"W. J. C. Miller, Esq., B.A."

Several letters having been read from applicants for registration as Dentists in virtue of their articles having been completed, it was resolved that the privilege provided by the first clause of Section 37 of the Dentists' Act, for persons whose Articles of Apprenticeship expired before January 1, 1880, be extended to all persons whose Articles had begun two years before that period.

ODONTOLOGICAL SOCIETY.

THE annual general meeting of this society was held at 40, Leicester Square, on January 9, THOMAS ARNOLD ROGERS, Esq., president, in the chair.

The following office-bearers, nominated by the council, were elected for the ensuing year:—President, Samuel Lee Rymer, Esq. Vice-presidents—Resident, J. Smith Turner, Esq., Charles S. Tomes, Esq., Henry Moon, Esq. Non-resident, J. E. Rose, Esq. (Liverpool), Walter Campbell, Esq. (Dundee), Wm. Doherty, Esq. (Dublin). Treasurer, James Parkinson, Esq. Librarian, Felix Weiss, Esq. Curator, S. J. Hutchinson, Esq. Honorary Secretaries, J. Howard Mummery, Esq. (for foreign correspondence), F. Canton, Esq. (council), T. F. Ken Underwood, Esq. (society). Councillors—Resident, T. Charters White, Esq., G. Wallis, Esq., W. F. Henry, Esq., Alfred Coleman, Esq., J. Stocken, Esq., Joseph Walker, Esq., Isidor Lyons, Esq., Geo. A. Ibbetson, Esq., Ashley Gibbings, Esq. Non-resident, T. J. Browne-Mason, Esq. (Exeter), W. Williamson, Esq. (Aberdeen), J. E. Palmer, Esq. (Peterboro'), William Fothergill, Esq. (Darlington), Alfred Jepson, Esq. (Leamington), Martin Magors, Esq. (Penzance).

Mr. HENRY SEWILL showed models of a case of exostosis of the external alveolar plate of the upper jaw, the bony mass being most marked over the region of the molar teeth. The patient was a gentleman aged thirty-nine, and was not aware of the growth. Mr. Sewill did not think the enlargement pathological. Mr. Sewill next showed a model of a case which had been before his notice for six years, in which an upper lateral was elongated. There was no absorption of the alveolus, nor any indication of disease. He had, in another nstance, recently removed three incisors which were affected with chronic wasting of the alveoli, a condition he now thought was possibly caused by the pressure of mastication. He mentioned the case of a young lady, aged fifteen, who came to him some months ago with an upper temporary central incisor still in place, and very loose. Mr. Sewill removed it, but after waiting some time its permanent successor did not appear, and he therefore fitted an artificial tooth in its place. The patient having gone abroad has prevented him from knowing whether the permanent tooth has yet appeared. The friends were, he thought, rather disposed to blame him for having removed the temporary tooth too soon, and he was anxious to ascertain the general opinion of members respecting the proper course to pursue in such cases. Mr. Sewill also showed a cast illustrating the harm that might be done by operating for the cure of cleft palate in unsuitable cases. The result of the operation in this instance had been to leave the patient in a worse condition than she had been before, the soft palate not closing at the back of the throat. At a former meeting he related a case in which paralysis of the parts supplied by the inferior dental nerve had followed the extraction of a left lower wisdom tooth, the root of which was perforated by a foramen through which the nerve evidently had passed, and some months afterwards but little return of sensation had taken place. Mr. Sewill saw her again on December 9th, and he was pleased to find that almost complete recovery had taken place, though there was still slight impairment of sensation.

After some observations by the President, Mr. Coleman, and Mr. S. Bennett, Mr. HUTCHINSON had known several cases in which temporary teeth had been removed and the permanent ones had not appeared. He at present had a patient, aged about forty, whose temporary canines were still in place and fulfilled their mission fairly well.

Mr. CHARTERS WHITE mentioned the case of a Scotch girl, aged twenty-four, who retained her upper temporary canines, the permanent canines not being erupted. Mr. White removed the former, and found that the roots were absorbed. The same condition existed in her father.

Mr. MARCUS DAVIS on one occasion had a subject for dissection, apparently about fifty years of age, in whom one of the lower second temporary molars was still in place. He cut down upon the bone below it in order to ascertain whether the permanent tooth was present, but he found only the vacant space in which it should have been. Had the temporary been extracted there would have been nothing to succeed it. The specimen is in the museum of the Students' Society of the Dental Hospital of London.

The PRESIDENT said that no general rule could be laid down for these cases, each individual case must be treated according to circumstances.

Dr. STERNFELD showed some of his microscopical specimens illustrating the structure and development of the teeth of the common pike, giving a description of them. He thought the term osteodentine given to that structure by Mr. C. S. Tomes inaccurate, and considered it vaso-dentine. The specimens beautifully showed the developing columnar odontoblasts, and, externally, the columnar cells of the enamel organ.

Mr. HOWARD MUMMERY read an abstract of a paper by Mr. C. W. Dunn, of Florence, entitled "A Study on Diseases of the Teeth." Travellers have said that diseases of the teeth in savage nations are not to be found. The savage man lives in the open air, his food is obtained by hunting, &c., and his nervous system is unharmed by study, his constitution is healthy, and his forefathers have had good teeth. With regard to civilised man the opposite of these conditions attains. In order to gain information of a definite kind, Mr. Dunn had printed a series of twelve questions, and sent them to the communal doctors in the most remote and little known parts of Italy. That kingdom contains a population subject in different localities to very different conditions of life. On the coast of the mainland, and also of the islands, Sardinia, Sicily, and Elba, the inhabitants eat much fish. In the cities more meat is consumed; whilst in the country districts many live almost exclusively on Indian corn flour, chestnut flour, or rice, and very many eat neither meat nor fish. The variations in soil and climate are almost as great, including low marshy plains and elevated mountainous districts, some land of wonderful fertility, and some regions, bare and sterile. The questions were also sent into the Alpine region, to Spain, France, &c. The following were the questions:—

1. In the locality frequented by you, which disease of the teeth predominates, Caries or Periostitis? Do young children suffer from either of these diseases?

2. Is the population in general robust or weakly?

3. Have you been able to observe whether the teeth of those living in towns and cities are better than of those living in the country?

4. Which suffer more from the teeth, the inhabitants of the plains, or those of the hills?

5. Are there mines in your neighbourhood? Please state the nature of them. Have you been able to observe whether those working in the mines suffer more or less from their teeth than others living in the neighbourhood?

6. What is the usual drink—beer, spirits, wine, or anything else?

7. Do the people smoke much or chew tobacco?

8. What is the usual daily food?

9. Are there forests, bogs, lakes, hills, or downs in the neighbourhood?

10. Is there any tendency in the teeth to become loose at an early age?

11. On what soil or formation are you?

12. Can you make any special observations on the formation of the enamel; the shape, size, and regularity of the teeth; or any other observation which might be interesting?

To these questions he had received forty-four complete sets of answers, and of these he gave an analysis. In twenty-two places caries was said to abound; these included the districts of Bologna, Palermo, the Waldensian Valleys, Verona, &c., and the causes assigned were marshes, rice grounds, malaria, stagnant waters, excessive irrigation, lead mines. Scrofula and anæmia predominated in these districts, and food was often poor and scarce. In fourteen places there was said to be little caries; these were for the most part situated on gravelly soil, or in the vicinity of the sea, or they were mountainous districts. There were only four places where the teeth were said to be good; of these Perrero, in Piedmont, is 1,500 metres above the sea-level; the others were Bergamo, Bordeaux in France, and the vicinity of Athens. All agreed in saying that those who worked in the open air generally suffered little.

Though the facts as yet received were too scanty for the formation of any precise conclusions, Mr. Dunn thought they were not without interest, and he offered them in the hope that others would carry out inquiries in the same direction.

Dr. STERNFELD read the notes of a case of a very large fibro-cystic tumour involving the left half of the lower jaw, and showed some photographs of the patient before and after the operation.

Mr. PARKINSON, treasurer, read his report for the past year. The receipts were £557, and the expenditure £364, leaving a balance of £193.

Mr. WEISS, librarian, drew attention to certain deficiencies, which he hoped might be supplied. The first volume of the "British Journal of Dental Science" was incomplete; he had only an imperfect set of "The Forceps." The "Transactions of the Society of Arts" for the year 1826 was a desideratum, and so was a copy of Mr. Chitty Clendon's work.

Mr. HUTCHINSON, curator, said the museum was now in perfect order, having been entirely rearranged, and a new catalogue had been printed.

The PRESIDENT then delivered his valedictory address. In earlier years the objects of the society were political; but, by the accomplishment of its aim, the political had given place to the scientific; and it appeared to him desirable that the several Dental Associations should keep in view the political needs of the profession, and the society be left free to treat the more scientific questions. Fears were expressed at the commencement of the year that the supply of papers would suffer from the competition of the Medical Congress, but no inconvenience had arisen from that cause. The papers of the past year have been of general and special characters. Mr. Macnamara read a paper on Sarcoma of the Jaws; and they shall not very soon forget Mr. Charters White's paper on the Gustatory Organ of the Tongue. Mr. Kinsey on the Oral System was full of interest to all. Mr. Stocken on the value of Constitutional Remedies in the treatment of certain Dental Affections showed how thorough a master he is of that subject; Mr. David Hepburn on cases of Suppuration having a Dental Origin; Dr. Richardson on the Causes of Dental Caries; and Mr. Coleman on Anæsthetics, amply sufficed to place the session just passed on a level with any that had preceded it. In the early part of the year a long-pending question was decided, and the qualification bye-law will come into operation next November. The last occasion on which undiplomaed candidates can be elected will be June 5, 1882, and therefore all such as might be desirous of joining must be proposed not later than March 6.

After referring to the services which had been rendered to the society by Mr. Willoughby Weiss in arranging the museum and drawing up the descriptive catalogue, Mr. Rogers alluded to the additions which had been made to Dental literature by Mr. Coleman, Mr. Arthur Underwood, and Mr. Oakley Coles. An addition had also been made to the periodical literature by the birth of the DENTAL RECORD; and he was inclined to think that a quarterly journal would find support. Amongst the events of the year must also be mentioned the election of Mr. E. Saunders to the presidentship of the Metropolitan Counties' Branch of the British Medical Association, and Mr. Charters White as president of the Queckett Microscopical Club, the one as the successor of Andrew Clark, John Wood, and Habershon, the other of such men as Lionel Beale, Huxley, and Cobbold. The great event of the year had been the Medical Congress, a subject upon which he felt it most difficult to treat in such an address as that which he was then called upon to deliver. In whatever light they view that great meeting, the Odontological Society may well be proud of having been the active agents in bringing about the recognition of their specialty and a distinct section being assigned to it.

In conclusion, Mr. Rogers congratulated the society selecting Mr. Rymer as his successor, and assured them that many of his closest friendships had arisen out of his work in the society, and many would be the pleasant associations in connection with it which he should bear away and hold in remembrance as long as memory should last.

Mr. IBBETSON, in proposing a vote of thanks to the president, said that all would agree that their president was entitled to their warmest thanks for the way in which he has discharged the duties of the chair during his term of office. It must be admitted that he had been singled out, that he had had a noble example from his father, who took so much interest in the advancement of their calling, and it seems to have been the aim of the son to emulate the example of his father. I believe his richest reward will be to receive your assurance that he will ever look back upon his services to this Society with feelings of unqualified pleasure and gratitude. I therefore propose a hearty vote of thanks for the way in which he has discharged the duties of the chair.

This was seconded by Mr. J. R. MUMMERY, and carried with much applause.

The PRESIDENT returned thanks, and acknowledged his obligations to the secretaries and other officers of the society.

ODONTO-CHIRURGICAL SOCIETY.

THE ordinary monthly meeting was held on the 12th of January, JOHN SMITH, Esq., M.D., F.R.C.S.ED., President, in the chair.

The discussion was then opened on Mr. Biggs'* paper on Vulcanite Dentures, read at last meeting, and an abstract of which was published on page 38.

Mr. MACLEOD said—The paper is one which, though it may lead to profitable conversation, is hardly one of the nature to start a severely adverse, and therefore lively critical discussion, from the simple fact that it deals with a subject with which we are all pretty familiar, and in regard to which we go upon very much the same lines as Mr. Biggs himself. Still, there are one or two statements put forth which can hardly pass without remark. In the opening, Mr. Biggs said that plaster for dental purposes was not improved by the addition of any chemical substance. I think that is too general and sweeping a statement. It holds good so far as sodium salts and other efflorescents are concerned; but I find the addition of potash alum more rapidly sets the plaster, and thus prevents that large amount of irregular expansion which generally occurs when the plaster is simply mixed with plain water, and the effects of which are more frequently felt than acknowledged. Mr. Biggs gives us as his reason for it that the addition of potash alum does not improve the plaster, but rather deteriorates it, especially when put in the vulcanizer. Now, on the contrary, I find that the plaster mixed with potash alum is quite as strong after being steamed as plaster mixed with water alone; and if this is so, then the other advantages which I have mentioned in connection with its use certainly recommend potash alum to the attention of the profession as a useful adjunct, not only in taking impressions, but in the general use of the workshop. With regard to flasks, Mr. Biggs queried, "Of what use is the lid of a three part flask?" The lid, I think, is a useful and necessary appendage. It enables you to pour plaster on and around your case in small quantities, and so the better ensure the absence of air blows; and a second and important use is that by removing the lid you can cut down to the under half of the flask, remove the upper, and clear your work of the plaster encasement, without subjecting the delicate porcelain parts thereof to the strain of twisting which accompanies the separation of the two halves. These, I think, are advantages sufficient to recommend its continuance, and there is no disadvantage connected with its use which can possibly cause one to cavil at it. Of course, in the manner in which Mr. Biggs described his method of imbedding the wax duplicate, instead of using the plaster model, it might not be quite so necessary in the insertion of the piece, but it is equally necessary in the extraction of the piece from the flask after vulcanization. As to imbedding the wax duplicate, as described by Mr. Biggs, in lieu of steaming upon the original plaster model, I do not think that it is a method which will meet with the general approbation of the members of this society, for the simple reason that it had always been their endeavour—or why did they use plaster of Paris in impression taking? —to get as correct a duplicate as possible of the mouth, undercuts and interstices included, as on these they depended very much; or, rather, on the adaptation of the plate to these they depended very much for the retention of the artificial denture. Mr. Biggs admitted that by his method the plate did not fit so accurately to the interstices in partial cases, but said that it went easier into the mouth. No doubt it did get easier into the mouth, but it would get out of it easier too; and that would make one very dubious as to the doing away with the vulcanizing upon the original plaster model. Another portion was original on Mr. Biggs' part, namely, the dicing by means of netting on the palatine surface of the denture. I cannot say that I agree with Mr. Biggs in considering it either useful or ornamental, nor can I see of what avail it would be as a preventive measure against cutting the palatine surface of the denture by the workman, because the plaster would be as likely to be filled with air blows as before, and the netting would not prevent the rubber getting in. Then he spoke of the advantage of scraping the buccal and labial surface of the model, and also across the posterior palatine portion, so as to secure a more close adaptation of the piece. That I consider quite unnecessary, if the original model is used ; but it might be somewhat necessary if they used Mr. Biggs' method of the wax duplicate, and imbedded it in the manner described by him. But even then, it could only be occasionally used with success, because they could not possibly scrape the buccal surface of the model without causing a tightness and pressure ; and unless they scraped it upon a portion of the buccal surface which lay at right angles with the alveolar border, and was opposed by a parallel or an undercut surface, it would only lead to displacement.

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* In our abstract of Mr. Biggs' paper the name was erroneously printed "Briggs." ED.

Mr. MACKINTOSH—Although agreeing to a great extent with Mr. Biggs' methods of working vulcanite dentures, I differ from him on one or two points. First, as to flasks, I prefer gun-metal, as it resists the action of the sulphur, and although not stronger than the malleable iron, it lasts much longer, provided it be of the same weight of metal ; those flasks got at the Dental Depôts being much too slight. The lid gives facility in cutting out the case when vulcanized, but is a source of weakness to the flask. The union of a model with the investing plaster in the flask is, I think, quite strong enough for all practical purposes, provided the model be well soaked and inserted with its base resting on the bottom of the flask, and the plaster be thoroughly set before proceeding to pack and vulcanize. I see no objection to Mr. Biggs' method in using his wax base plate as his model, if it can be made not only to fit the model exactly, but can be taken off the model without disturbing the fit ; for sometimes we find a model of the upper jaw which is undercut both on the buccal and lingual side, and where it would be very difficult to take off the base plate without disturbing the fit. For some years I have been painting the models with a solution of silicate of soda, and have found it of great advantage in strengthening the models, and in giving a smooth surface to the vulcanite, which parts from the plaster without any brushing. I also cover the outer surface of the base plate with strong tinfoil, which is a very great saving of time, as the plate requires very little polishing after leaving the vulcanizer. I have made one or two experiments on Mr. Biggs' principle, but they have not been so successful as I anticipated, although I have taken particular care in having a good fit before putting into the flasks to be vulcanized. I find there is considerable contraction in the vulcanite.

Mr. WILSON—I quite agree with Mr. Biggs that the mode of heating, as also the temperature to which the rubber is exposed in vulcanizing, is really a point of some importance. The slower the temperature is raised to the requisite point, the better for the rubber; but as regards the length of time that degree of temperature should be kept up, it seems to make little or no difference whether it is 1¼ or 10 hours. The tendency is undoubtedly to rush up the heat too quickly. I consider the thermometer, as usually inserted, to be simply useless as a guide to the temperature of the interior of the boiler. The steam pressure gauge seems the only reliable one. As regards the flask, I may say I have never used a three part flask, and I think that in the method I follow, Mr. Biggs will find a slight improvement on that described in the paper. Instead of depending on an overlapping edge of plaster (necessarily thick) to retain the teeth *in situ* under pressure, I use a curved brass plate, which has its upper edge bent at right angles so as to form a ledge, more or less broad, as the case requires, so as to overlap the edges of the teeth, while the lower edge is bent irregularly, so as to offer great resistance to displacement when imbedded. A very thin layer of plaster is needed between the plate and the teeth, so that the parts are much better exposed for packing. (Mr. Wilson passed two of these plates round for inspection.) Then, as regards the model to vulcanize on, I have, as to its preparation, to differ *in toto* from Mr. Macleod, as, while he looks on potash alum as almost invaluable when you want plaster to set rapidly, I consider its presence as a disadvantage when the model has to stand pressure *when moist*. So long only as the model is kept perfectly dry, does it add to its hardness. As to Mr. Biggs' mode of dispensing with a duplicate model, and flasking the wax direct, it certainly saves time, and the case may fit as well as those on metal plates do; but you certainly will not get the fit you would obtain from a duplicate of the original plaster impression. As to scraping from the buccal and the extreme palatine margins, I think that with a plaster impression it would do harm in place of good, these being just the parts I find to hurt, if there is tightness at all. Lastly, as regards the want of taste in setting the teeth, I think gum blocks the most thoroughly mechanical; you cease to have control over your work, and are bound down to the particular style of the blocks. If a breakage occurs, it means the whole block, and I can easily conceive of circumstances where it may involve a new set. As regards artistic effect, I think nothing gives the operator a better chance than when he has the separate teeth to place in any position relatively to each other that he pleases.

Mr. Campbell—I have just one word to say regarding the cutting and carving of models. I think that a model made from a correct plaster impression could not but be harmed by cutting and carving, especially the buccal and palatine surface of the models. Mr. Biggs contrasted the use of celluloid with vulcanite. So far as my experience goes, I cannot say that celluloid is very useful, except so far as they might use it for lining the gum-front of a vulcanite case, and here it is unsurpassable.

Mr. Finlayson—In the use of potash alum I have had considerable experience since the subject was brought under our notice as a society, and I do not think that the stucco models made with it in combination have ever, in any case, been found to get crushed in the flask or in packing—and the admixture is employed throughout the whole process. The solution employed is of the strength of half an ounce to the gallon of water. With models taken in plaster with alum I have always been able to obtain a good suction, which has been found permanent in the finished plate, provided the gums were thoroughly attenuated and not liable to further change of form. The dicing spoken of, and shown by Mr. Biggs, I do not like, and I think it less artistic than the natural rugæ of the palate. I quite agree with the remark made by Mr. Biggs in his paper, supported by Mr. Wilson, that higher temperature and diminished time produce shortness or brittleness of the cooked piece, and would at all times vulcanize, if I could afford it, in the way indicated by them.

Mr. Cormack—In regard to the plaster, I must side with Mr. Wilson. I have not had very great experience in gum blocks, although I have used them. But probably it will be better for me to speak upon what I know well about. When in Glasgow some time ago, Mr. Biggs kindly invited a number of his patients, who wore complete upper sets of gum blocks, to see me. I may have been fortunate in the faces or in the gums, but these cases which I saw, in regard to artistic appearance, were everything that could be desired. I was delighted with them in regard to the fit, which was perfect, and I have never yet seen any upper cases adhere to the palate with greater tenacity. One of the cases had been in the mouth twelve months, if not more, and I think that is a good test. However, it requires a large stock of teeth to select from, which is a drawback, but as Mr. Biggs made it a speciality, he had that, and consequently had little difficulty in meeting different requirements. I have tried his way of pressing the wax plates on. In a great number of cases I have been successful. I have occasionally made a slip, but when I take a plaster model and can take two casts from it, I prefer that mode.

Mr. Biggs—I have to thank the gentlemen present for their very courteous criticism of the paper. I am sure that it has been an honest criticism, which is a great matter. I asked for fair criticism and desired no favour; I have just got that. As regards what Mr. Macleod said in connection with the plaster of Paris, there is no person who is more willing to record his deep gratitude to Mr. Macleod than myself, for the great comfort it has been to know of the mixture of the potash alum in taking impressions. It has been one of the greatest boons to me since I have known it; and I think in saying that I am not saying too much. I have had great difficulty many a time in taking them as perfect as I can now do, since Mr. Macleod had introduced to the society's notice the mixture of plaster with potash alum. I beg, however, to differ from Mr. Macleod in the matter of the plaster of Paris being deteriorated by the mixture of any material whatever, when the flask was to be introduced into the vulcanizer. One of the things that shows me the weakness of Mr. Macleod's arguments was the reference to the little air blows. Air blows are a thing I know nothing of. The plaster I use is of a very thick consistency, so that I never see such a thing as blows in the plaster, which I used to have when I used the plaster very much thinner. If the plaster is made sufficiently thick and stout, and used without the addition of any of those other things, every member would bear me out in saying that they would find the plaster much better. The difficulty that has arisen in some of the members' minds has been caused by the fact that I have not been able to carry them along with me to the full extent that I had meant. Those things were very apt to be misleading when not properly carried out, and a person not having seen the thing personally done could not carry the purpose properly with him. In regard to the netting, I still hold it to be a very good thing. The netting on the surface of the model brought the cast away much cleaner from the model, and it was no detriment whatever. Then Mr. Macleod said that vulcanite as well as celluloid was darkened by tobacco, but let me tell Mr. Macleod that in the case of the celluloid it permeated through and through, while in the case of the vulcanite it was only on the surface. I might say that I have used all sorts of contrivances for keeping up the suction cases. I have often made those little discs which were supposed to come from America; but I have given all those things up and come to this, and I think that it has been the most successful I have ever wrought out.

The CHAIRMAN said—I feel sure the society is very much obliged to Mr. Biggs for his paper. I think it a very important paper indeed, and I would have made any remarks necessary, but really, every, point has been taken up. I think, however, that the firing from the wax pattern plate that Mr. Biggs referred to, is more adapted for partial cases. I have sometimes overcome a difficulty by this method, where a sharp undercut impression was taken in plaster. This is not so necessary if we take it in wax. In regard to scraping, of course if carried to excess upon the buccal side of the gum, or even on a deep palate, it might produce a tendency in the plate of springing down off the palate, if carried too far. Its principle is, however, very much the same as providing in the centre of the palate a suction cavity. I think we should tender a vote of thanks to Mr. Biggs for bringing such a practical paper before this society.

CASES OF INTEREST.

The SECRETARY said that the next item on the programme was awanting. Mr. Watson was to have brought there a specimen of his handiwork, in the shape of an artificial nose, but neither Mr. Watson nor the patient had appeared. He (the Secretary) noticed in Monday's newspaper, with feelings of regret and sympathy, that the infant son of Mr. Watson had died at Coldstream. This was, no doubt, the cause of Mr. Watson's absence, although he had no intimation to that effect.

ARTIFICIAL VELA.

Mr. MACLEOD, in exhibiting an artificial denture with velum attached, said that he did so not in consequence of a peculiarity of the case itself, but that he might introduce to their notice a more simple way of making moulds for similar cases. It was an improvement upon Mr. Norman Kingsley's and Mr. Smith Turner's. He was free to say this, as it was not his own device, but the idea of his assistant, Mr. Durward. It produced a velum which was free from any transverse ridge, or rough edge, which would require trimming before being put in the mouth.

The mould and velum were handed round, and elicited the approval of members.

Mr. E. A. CORMACK exhibited an Exfoliation from Right Lower Jaw of a little girl, æt. three and a half years, a sequel to measles; also an accumulation of tartar on a lower denture of two teeth. This was in the mouth for nine years.

Mr. WILSON exhibited a permanent upper canine, in which the enamel extended nearly half way up the root, on both lingual and labial surfaces.

NEW ADAPTATION OF COFFER DAM.

Mr. BIGGS showed a new Coffer Dam Appliance. Troublesome, nervous patients are frequently cropping up, having sensitive lower teeth to fill. To apply the ordinary Coffer Dam upon a number of such teeth, where, probably, not one of them can be plugged on the first visit, would be simply a great waste of time. And yet the trouble in excavating and the pain is very greatly increased by the saliva flowing into the cavities, added to which, the provoking habit such patients have of pushing their tongue into the cavities, sometimes precluding the possibility of seeing, not only the cavity, but even the tooth itself.

The apparatus is designed to act as Gag, Lip Distender, Tongue Holder, and Coffer Dam, all in one, with the advantage of being applicable in a second, and leaving the entire lower set of teeth free to be operated upon individually or collectively.

The CHAIRMAN intimated that the next meeting would take place on Thursday, the 9th February, when there would be read a paper by Mr. Laws, of Weymouth, "On Surgery Talk; or, Conversations between Dentist and Patient."

DENTAL HOSPITAL OF LONDON.

CONVERSAZIONE OF THE STUDENTS' SOCIETY.

ON Wednesday evening, January 18th, the Students' Society of the Dental Hospital of London held a conversazione in the rooms of the hospital. There were exhibited many things of interest, including several of Coxeter & Son's medical batteries, a model of an electric railway and of an electric screw propeller. There were also a group of composite portraits, by Mr. Francis Galdon, F.R.S., and Dr. Mahomed, illustrating the physiognomy of disease. The method of their production is, briefly, that a series of portraits is obtained of diseased patients, and, by a particular camera arrangement, an average photograph of the group is obtained. Mr. Walter Coffin exhibited his very interesting series of expansion and regulation models and plates. There were, likewise, a goodly display of Dental novelties, and other things calculated to attract the attention of visitors, of whom there were about 200. A selection of vocal and instrumental music added considerably to the pleasures of the evening.

NATIONAL DENTAL HOSPITAL AND COLLEGE.

EXAMINATION PAPERS.

THE following questions were given at the Class Examination on Dental Anatomy and Physiology, on the 19th ult. :—

1.—Enumerate the general features of the teeth and jaws of the several existing orders of Reptilia.

2.—In diphyodonts the temporary teeth are regarded as additions to the second or permanent teeth. Give the arguments for and against this theory.

3.—What are the so-called glands of Serres; and the gubermaculum?

4.—Through the interglobular areas of the dentine the tubes run. Why should that be so?

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

To the Editor of the DENTAL RECORD.

SIR,—My attention has just been called to a paper on Generalized Treatment of Irregularities, by Mr. W. H. Coffin, which was read by that gentleman, at the International Medical Congress, and which appeared in the RECORD of September this year. I must confess I was simply stupified to find that the author of the paper claims unblushingly the invention of the expansion plate for his father, and all through the paper and subsequent discussion the plate is spoken of as "Dr. Coffin's Expansion Plate." Now, I simply wish to state that Dr. Coffin has just as much to do with the invention of that plate as the "man in the moon," and no more.

The invention in its entirety is wholly and absolutely mine, which I can abundantly prove, and in common justice it should be known, both now and hereafter, not as Dr. Coffin's, but as "Peter Headridge's Expansion Plate." Moreover, I claim the application of steel wire to every kind of regulating.

PETER HEADRIDGE.

1, Lime Grove, Oxford Road, Manchester, December 21, 1881.

Editorial.

QUACKERY IN HIGH PLACES.

THE article by Dr. Arkövy recording, as the results of experiments on dogs, the action of tri- and pent-oxide of arsenic, and of pepsine, on the tooth-pulp, is exceedingly interesting and valuable. In these days of conservative Dentistry, the treatment of the tooth-pulp forms a very considerable part of the practice of the Dental Surgeon; and for the devitalization of the pulp, arsenious acid chiefly is used. Of the precise effects which that agent produces, the text books do not give any information; indeed, we may at once confess, our knowledge of the initial changes in the tooth tissues, resulting from the local application of this medicine, is so meagre as to scarcely deliver us from the accusation of charlatanism. But critics have, unfortunately, too many points of like nature at which to assail our profession; and it is only by experiments that we can hope to obtain such information as to enable us to possess that full and necessary knowledge which science demands. The lamentable effects of the administration of the Cruelty to Animals' Act are as a millstone round the neck of

Progress; and the Dental section should strive with the great body medical to throw off this shackle of misdirected energy.

Dr. Arkövy deserves the thanks of the Profession for his very acceptable contribution, and we are pleased to now be able to reproduce the article in full (see page 61), with the exception of some small woodcuts. While we recognise such increments to our knowledge, let us endeavour to place all facilities in the way of the very few who have the ability, and are willing to sacrifice their time, for legitimate investigation. This is the direction in which we must work, if we would have the Dental Profession raised above the scorn of quackery, and to the status of a true and established science.

THE PRESIDENCY OF THE ODONTOLOGICAL SOCIETY.

The election of Mr. Samuel Lee Rymer as President of the Odontological Society will, we are sure, be received with unqualified satisfaction by the entire Dental Profession. Up till within the last few years the honours which the Profession had to bestow were only two—since 1856 the Presidency of the Odontological Society, and that of the Odonto-Chirurgical Society since 1866. We may also mention the Chair of the more recent, but almost exclusive Association of Surgeons Practising Dental Surgery. But during the last three years there have been created chairs of several societies and representative associations. And although the Presidency of the British Dental Association ought to command the greater constituency, yet, at present, the Odontological Society may fairly be regarded as having at its disposal the highest honour which our Profession has to confer.

Mr. Rymer's exertions in the political interests of the Dental Profession first began a quarter of a century ago, and members of the old Metropolitan School of Dental Science and of the College of Dentists, will not have forgotten the labours of their chief worker. In the field of literature, too, Mr. Rymer is not unknown—he having contributed many papers to several periodicals, and he was for some time editor of the quarterly *Journal of Dental Science*. He has rendered good service to the profession, and this reward has been well earned.

GOSSIP.

FASOLDT, of New York, claims to be able to rule micrometer lines up to 1,000,000 of an inch.

MR. JOSEPH PARSONS has been appointed Hon. Dental Surgeon to he Halifax Infirmary, Yorkshire.

A LIST of members of the British Dental Association has just been issued. It contains many errors, and there are several omissions.

ACCORDING to Mr. Seyd's analysis of failures, seventy-one physicians, surgeons, and dentists failed during the year 1881, and seventy during 1880.

A FERTILE mule is on view at the Jardin d'Acclimatation, Paris. The offspring are five in number, three of which had a horse for a sire, and two an ass.

ON the 20th of January a show case was stolen by two men from the doorway of Mr. G. W. Pratt, Cavendish Street, Manchester. Two pounds reward has been offered.

THE draft of a Bill for the Amendment of the Patent Laws has been prepared by a committee of the Society of Arts, and is published by the Council of that society for consideration.

MR. GURNELL HAMMOND, L.D.S.Eng., has been appointed Dental Surgeon, and Mr. Richard Giles Bradshaw, L.D.S.Eng., Assistant-Dental Surgeon, to the National Dental Hospital.

THE *Ottowa Citizen* reports the discovery at Woodstock, Ontario, of a portion of the skeleton of a mastodon. The jaw, which is very complete, is 2 feet 4 inches long, and the teeth weigh four pounds.

PROF. DUDLEY states that a rod of iridium, prepared by the process introduced by Mr. J. Holland, of Cincinnati, has been used successfully in an electric lamp for sixty hours without change or loss of weight.

Johnston's Dental Miscellany, which has completed the eighth volume, has ceased to exist, the trustees of the late S. S. White having amalgamated with Johnston Brothers, and formed the S. S. White Dental Manufacturing Company.

THE flute played with the nostrils may be traced from India, where it is said to have a ceremonial use to prevent defilement through touching a low-caste mouth, over south-east Asia into Borneo, to the Fiji Islands and New Zealand.

DR. E. C. SPITZKA found in the egg of a turtle a live maggot crawling in the space between the half-dried yolk and the shell membrane. Foreign bodies have frequently been found in hens' eggs, as legs of beetles, straw, printed paper, &c.

THE *Geological Record* for 1880, just issued, contains a monograph by Prof. Marsh on the Odontorinthes, the extinct toothed birds of North America, in which he describes nine genera and twenty species of fossil birds found in the American cretaceous formations.

A CASE of chronic lead poisoning from the use of a face powder, which was found to be entirely composed of carbonate of lead, is recorded in the *Physician and Surgeon.* The patient was pale and weak, the wrists were flexed, and there was the characteristic blue line on the gums.

MR. FLETCHER, Warrington, has been awarded a medal for his laboratory apparatus, and he has also received a special award for a collection of gas furnaces, &c., exhibited at the Glasgow Philosophical Society's recent Exhibition of Apparatus for the Utilisation of Gas, Electricity, &c.

MR. EDISON has invented a portable electric light chandelier, and a current regulator which permits the light being reduced or increased, as desired; he, and also two other electricians, have invented "meters" to measure the quantity of electric current passing through any branch of a system, so that users may be charged according to the amount "consumed."

VOLUME III. of the "Transactions of the International Medical Congress" contains the transactions of the sections of opthalmology, mental diseases, diseases of the skin, diseases of the throat, diseases of the ear, and diseases of the teeth. A reprint of transactions of the latter section may be obtained for 5s. Orders for the work will be received by J. W. Kolckmann, Langham Place, W.

DR. J. H. GLADSTONE, F.R.S., thinks it fair to conclude that the formation of the persistent sea froth, which was so frequently observed on our coasts during the storms of last year, was due to the destruction of the sea-weed—not of that which is tossed about by every tide, but of the laminaria, which is uprooted and torn by the waves only when the violent agitation of the sea reaches a sufficient depth.

THE President of the Royal Society, William Spottiswoode, D.C.L., LL.D., in his address at the anniversary meeting of the society on the 30th of November, said eagerness to outstrip others rather than to advance knowledge, and a struggle for relative rather than for absolute progress, are among the dangerous tendencies peculiar to the period in which we live.

A PRETTY and interesting room-ornament may, according to *La Nature*, be made with a sponge as a basis of vegetation. Get a cheap sponge—the bigger the better—and having dipped it in warm water, squeeze out half the water. Put into the holes seeds of millet, barley, purslane, red clover, grasses, &c., and in general any seeds germinating easily, and that will give a considerable variety of colours. Place the sponge thus prepared on a vase, or hang it in a window facing the sun. Sprinkle it with water every morning during a week. The sponge will soon be covered with vegetation.

A NEW preservative, applicable to all animal and vegetable substances, has been recently patented by Prof. F. S. Barff, of Kilburn. It is a compound prepared by mixing boracic acid with glycerine. The former is dissolved in the latter by the aid of heat, the solution taking about four or five hours, care being taken, however, that the temperature employed shall not be so excessive as to decompose the glycerine. To such solution or compound a further quantity of boracic acid is added from time to time until the boracic acid ceases to be dissolved. The compound resulting when allowed to cool is solid, and is called by the patentee, boroglyceride, which is a new chemical compound.

M. GAUTIER communicated to the Paris Academie de Medicine the results of recent observations which afford reason for believing that the poison of serpents differs from human saliva in the intensity of its effects rather than in essential nature, so that the fears with which a human bite is often regarded may not be wholly unreasonable. M. Gautier took some twenty grammes of human saliva, and, after lixiviating and purifying, obtained a substance which, injected in the form of solution under the skin of a bird, had remarkable toxical effects. Almost immediately the bird was siezed with trembling. It staggered and fell to the ground in a state of coma and complete stupor, which terminated in death in half an hour or an hour, according to the dose injected and the vigour of the animal.

THE Solomon Islanders, though almost all cannibals, are singularly skilful in their surgery, setting arms and legs very successfully with bamboo splints. Their dentists, too, though somewhat heroic in their treatment, are but little inferior to their European brethren. When a man wishes to have a tooth or two replaced, a couple of assistants hold him firmly, while the operator, propping the patient's mouth open with pieces of bamboo, proceeds down along the gum until he has cleared the surface of the jaw-bone. Into the cavity thus made along the gum he inserts a piece of tortoise-shell or mother-of-pearl of the requisite length, and then binds the gum up on each side of the new tooth with a kind of vegetable glue. After a few day's feeding on liquid diet the wound generally heals, and it is a common sight to see old men with almost all their teeth replaced in this fashion.

M. PAUL BERT has lately communicated to the Academy of Sciences, Paris, the results of his experience with anæsthetics. With increasingly-strong mixtures of an anæsthetic vapour and air, a point is reached at which an animal in such an atmosphere is made insensible, and another point at which it is killed. The interval between these is the *zone maniable*, or working zone. M. Bert used chloroform, ether, amylene, bromide and chloride of ethyl, and the animals were dogs, mice, and sparrows. Under these conditions the fatal dose is precisely double the anæsthetic dose, and protoxide of nitrogen has a more extensive working zone than any of the other anæsthetics tried, the ratio being one to three. The zone is much greater for ether than for chloroform. In the common way of applying chloroform, with a compress, the limits of the working zone may be exceeded on either side. Chloroform acts, not by the quantity respired, but by the proportion in which it exists in inspired air. The author applies the mixture through a tube and a small mask. The anæsthetic dose for man he has not yet determined.

INTERCOMMUNICATIONS.

ANSWERS.

(9.) A LOVER OF FAIR PLAY.—According to the decision of the Medica Council the chemist you mention would be considered as "*bonâ fide* in the practice of dentistry"; but the question is not as yet definitely settled.—ED.

CORRESPONDENT.—The British Dental Association should be informed of the existence of Mr. Howard Lindsay, M.H., dentist and herbalist.—ED.

REMARKABLE.—Your communication is libellous.—ED.

STUDENT.—Your communication is too personal, and wanting in authority for the statement made. If you or the gentleman mentioned will write upon the subject, we shall be pleased to receive the article.—ED.

Communications.

Communications have been received from—Peter Headridge, Manchester; George Ward, London; Joseph Parsons, Halifax; G. J. Williams, London; F. Henri Weiss, London; Gurnell Hammond, London; James Murison, Aberdeen; G. B. Pearman, Torquay; Stephen Hoole, London; W. R. Humby, London; G. W. Pratt, Manchester.

Books, &c., Received.

"Journal of British Dental Association." "Dental Cosmos." "Le Progrès Dentaire." "El Progresso Dental." "Missouri Dental Journal." "American Journal of Dental Science." "Torquay Directory." "Tit Bits." "Items of Interest." "The Referee." "Report of the Edinburgh Dental Hospital and School." "Transactions of the Odonto-Chirurgical Society."

THE

DENTAL RECORD.

VOL. II. MARCH 1, 1882. No. 3.

CELLULOID.

By HARRY ROSE, L.D.S.Eng.

Lecturer on Dental Mechanics at the National Dental College, Dental Surgeon to the National Dental and Metropolitan Free Hospitals.

As the importance of Celluloid as a base for artificial teeth seems to be getting more and more recognised by the Dental profession, it may not come amiss in the course of the following remarks to draw attention to its manufacture and the method of working it.

Celluloid is composed principally of cellulose and camphor.

Cellulose, $C_6 H_{10} O_5$, is the constituent of wood cells, and in this way forms the greater part of wood. It is accompanied in the wood by a variety of substances, colouring matter, resins, &c., so that pure cellulose is hardly met with in nature, and is somewhat difficult to procure artificially—it exists, however, very pure in dressed cotton or linen, and in paper. It is a white, insoluble, tasteless substance, not readily acted on with weak chemical reagents.

Treatment with strong sulphuric acid converts it first into a body like dextrine, and by prolonged digestion into grape sugar; but if the acid be previously mixed with about half its bulk of water and then the cellulose, represented by a piece of paper, be dipped in it for a brief time and afterwards washed, it will be found to have become tough and translucent, and to have become converted into parchment paper. Very strong nitric acid converts cellulose into gun-cotton. Cellulose has the same percentage composition as starch, but differs from it entirely in its properties.

In the composition of celluloid for our purposes, hemp is taken and converted into paper, the paper is then immersed in a mixture of nitric and sulphuric acids for a certain length of time, and afterwards well washed; it, however, still remains as paper, but has increased very considerably in weight, and is now known as pyroxyline.

The pyroxyline is made into a pulp, and camphor, together with a small amount of oxide of zinc, and a trace of vermillion for colouring, is mixed with it, and it is then moulded into the form in which we receive it from the depôts.

It is truly a most beautiful material, and my liking increases rather than diminishes the more I see of it. Having now experimented and tried it in a very considerable number of cases—partial as well as whole sets—, I have not yet discovered any fault with it except the extra amount of care required for its successful manipulation. It is, however, desirable that all stumps should be removed, as the secretions from them seem to have the effect of completely destroying the colour of the material where they touch it, turning it a dirty yellow colour, and giving to the case a most offensive odour. Thorough cleanliness will do much to remove any disagreeable taint from the case; but over an unhealthy root the colour is sure to be lost.

A machine which is intended for celluloid should be used for that purpose alone. In taking into consideration that the temperature has to be raised to 245° Fahr. before closing the flask, any dust or dirt that may be in the boiler is almost sure to find its way between the two halves of the flask, and so on to the base, with the result of staining or spotting it.

I always cellulize on the original model of the mouth, and do not touch the inside of the work afterwards; so it may be imagined that the model is not damaged in the process. Of course it is destroyed when the piece is finished, the same as in vulcanisation.

To explain why the teeth are not rubbed or broken I must mention that I make a dummy piece first of all in wax, as if for a bite; then I take a metal model and place the dummy on it, and insert in a celluloid flask as in the case of a vulcanite piece. I next take a suitable base or plate of celluloid, and, after removing the wax dummy, place the base, first roughly fitted, in the space left by the wax—it does not matter if the flask is separated to nearly the full extent of the guides. Then adjust the flask in the celluloid cramp, which, in the machine I use, is fastened to the lid of the boiler and is removed with it, and place in position in the boiler. After screwing on the lid, the temperature is raised to 212° Fahr.; at that heat the celluloid softens, and the screw of the cramp can be turned until the base has assumed its proper shape, viz., that of the model. The steam can then be let off, and the cramp with the flask still under pressure can be plunged into cold water and allowed to cool. The piece can now be taken out of the flask, removed from off the metal model, and trimmed into shape. If the metal model is undercut, or there are teeth that will not permit of the easy removal of the base, it may be made to part by heating it in boiling water, this softens it again and facilitates the operation.

It will be perceived that, so far as we have gone, the metal model has borne the brunt of the battle. I now arrive at that stage where the wax dummy is replaced by one of celluloid, which has to go through the process of having the teeth forced into it; this is accomplished on the original plain plaster model of the mouth.

I will now suppose that a piece of work has been modelled up, say a plain upper or lower set, and inserted into the lower part of a flask, with the teeth and wax coming away in the upper part. After washing out every particle of the wax, the dummy celluloid base is placed on the model, which it nearly or quite fits, and the flask is put together to be squeezed home. But something has been omitted that would spoil the whole of our work, viz., to cut away the plaster to allow of the escape of the surplus material: this requires very great care in doing to ensure success, as the only way we have of judging that our bite is not raised, is by having the two halves of the flask to close accurately.

When we take into consideration that we have to deal with a soft and elastic material, and that it must be kept under pressure the whole time until it is quite cold, it will be understood that the utmost nicety is required to so adjust the outlets that pressure may be kept up, and yet allow every particle of the material that is not wanted to come away, and that in every direction—not like vulcanite.

I generally mark a quarter of an inch margin all round the work in the flask, beyond that margin I cut away enough plaster to allow of even more surplus than I expect there will be to fill it up. Now the quarter of an inch margin I reduce in thickness one-sixteenth of an inch all round. It will at once be understood, that, when being pressed home, the celluloid is forced into all the crevices of the teeth and model, then through the margin having an opening all round of one-sixteenth of an inch, after which it can pass out, meeting with no opposition whatever.

Now let us notice what occurs; and we will presume that the flask is in the cramp, the cramp in the boiler, and the temperature raised to 260° Fahr., and the flask screwed down, the mark on cramp screw registering if it is so. The gas having been turned off, the steam is let off, and the cramp removed from boiler and placed directly in cold water; when quite cold, and the work removed from the flask, what do we see? A celluloid case, having an outer margin or frill one sixteenth of an inch in thickness and a quarter of an inch wide; beyond that width it may be anything from a quarter to half an inch thick. The quarter of an inch margin is the same as base plate, but the thick part beyond is usually porous; this is accounted for by it not having been formed under pressure. When the heat rises to 260° Fahr. the gas should be turned out. That is the highest point that the thermometer should reach. The screwing down of the flask should begin from about 230° Fahr., turning very gently at first, so as to keep pressure on the base, then pause until 240° Fahr. is reached, then have another turn or two, then another rest—the final squeeze should be at 260° Fahr.

Too much care cannot be taken at this time, as the too early pressure of the base when not at its softest condition, may break the teeth of the plaster model; and not putting on pressure at the right time may render the base porous, or not reliable.

[*To be concluded.*]

NITROUS OXIDE GAS AS A LOCAL ANÆSTHETIC.

By C. J. WALLIS, L.D.S.Eng.

IN reference to the remarks by Mr. Graham Young, in the *Journal of the British Dental Association*, for February, concerning an accident with the above anæsthetic, the following experience of my own may interest that gentleman and other readers of the DENTAL RECORD. Some few years since I met with a similar, though, apparently, less severe, accident to that mentioned by Mr. Young, which resulted in temporary loss of sensation in the finger operated upon, the skin turned perfectly white, and ultimately came off. This led me to try the effect, and test the value, of nitrous oxide gas as a local anæsthetic, and with the following results:—I accidentally pricked one of my fingers with a dental excavator, and this resulted in inflammation and formation of pus; when ready for operation, I placed my finger within a couple of inches of the top of the gas bottle, and turned on the gas; sensibility was entirely obtunded, and I freely lanced the finger, feeling not the slightest pain; in fact, complete sensibility was not restored for some hours after, but when the circulation was somewhat restored, the pain became very acute, and continued with gradually lessening severity for about a couple of days. The wound did not heal readily, and the finger had a shrivelled, dead appearance for some days after. The extreme and continued pain, together with the dead appearance of the finger, may have been due to my having kept the finger under the influence of the gas far too long a time, for I believe a very few seconds would suffice to produce the required state of anæsthesia for a like operation. The second trial was for the removal of a portion of the large toe-nail, which had grown into the toe, and become very painful. I treated this in a similar way with the gas, then removed the offending portion of the nail, and this, too, without the slightest pain; but here again the wound was troublesome, and slow to heal—doubtless, from the same cause. As a further test of its value as a local anæsthetic, I decided to try the effect of N_2O, in dental operations, and with this view arranged with a friend, a chemist's assistant, to remove his upper lateral tooth, which was much misplaced, being quite behind the central and canine. However, when it came to the point, my friend's courage failed him, and he requested me to try the effect of the gas on one of his fingers first; this I did, and, unfortunately for my experiment, it further decided him not to submit to the more important operation. From my limited experience, I am inclined to think that with due care as to the proper application of the gas, it might be found a useful local anæsthetic in minor surgical operations; and I hope that some member of the profession, who has time and opportunity at his disposal, may further test its value.

ANÆSTHETICS.

A Paper Read before the Students' Society of the National Dental Hospital, February 3rd, 1882.

By MORGAN HUGHES.

MR. PRESIDENT AND GENTLEMEN,—I propose to call your attention this evening to the subject of Anæsthetics, a subject so vast that it will be impossible for me even to touch upon some of its most interesting branches. Apart from the interest and importance of the subject to Dental Students in this age of "Painless Dentistry," one chief inducement to me to write on it was the certainty that I should find sufficient material to work upon. But, alas! I have found the truth of the adage, "You can have too much of a good thing." Every doctor of eminence, and many who wish to be so branded, seem to have written on the subject, each having his own original theories, which, of course, have to be investigated before being cast aside as worthless. Often and often, while reading up for this Paper, have I appreciated the truth of the saying, "All men are liars."

For the discovery of anæsthetics, in the modern meaning of the term, we are, as you are probably aware, indebted to a member of our own profession; but various attempts have been made, even in very early times, to discover some agent which would dull sensibility to pain.

The ancient Greeks used a narcotic, made by soaking the root of the plant mandrake in wine; and Lucius Apulius, who lived about 160 A.D., wrote, "that if any man has to have a limb mutilated, sawn, or burnt, he may take half an ounce of mandragora wine, and while he sleeps the member may be cut off without pain or sense." This statement, made nearly 2,000 years ago, has been confirmed during the present century by experiments made on animals by Dr. Richardson.

The Chinese, the natives of India, and many other ancient races, were acquainted with various decoctions made from such plants as the hemp, the mandragora, and the monkshood, which had a more or less stupifying effect; but this knowledge being used chiefly for disreputable ends by heathen priests, magicians, and robbers, was kept secret, and, therefore, did not lead to further discovery.

In the early days of Operative Surgery, surgeons seems to have employed alcohol or opium to deaden, as far as possible, the pain from their operations. Richerhand suggested making the patient "dead drunk;" and it is a fact that patients have been painlessly operated upon while in this "happy" state. Larry, after the battle of Elau, found in the wounded a remarkable insensibility, and rightly attributed it to the intense coldness of the weather. We now utilise cold in producing local anæsthesia by the ether spray.

Moore's plan of compressing the nerves of a limb; Wardrop's, of excessive venesection; and Eskdaille's mesmerism, were all either inefficient, dangerous, or chimerical.

Towards the close of the last century, Priestley's discovery of oxygen opened a new field of research for chemists; and in the year 1800, Sir Humphrey Davy made his discovery of nitrous oxide, and its remarkable effect on the nervous system. He wrote: "Nitrous oxide appears capable of destroying physical pain, and may be used with advantage during surgical operations." This hint led to some experiments being made with this object; these, however, proved unsatisfactory, and the use of the gas was abandoned, except as a means of amusement, until 1844, when an American dentist—Mr. Horace Wells, of Hartford—began to use it for making his patients insensible to the pain of tooth extracting.

It seems that a Mr. Colton was lecturing in the town on laughing gas, accompanied by a practical demonstration of its effects on those members of his audience who wished to try it. Among these was our friend Wells, who was suffering from toothache. When he recovered from the effects of the gas, he found that his tooth had ceased aching. The thought then struck him that he would have the tooth extracted whilst under its influence. Mr. Colton again gave the gas, and Wells felt no pain when the tooth was extracted. Wells then began to apply his discovery for the benefit of his own patients, and, at the same time, endeavoured to induce his professional brethren to do the same. These, however, were, from various causes, either indifferent or actually opposed to the new idea, so that not yet was his discovery of much value to the public.

Like all great discoveries, it was not long before it led to others in the same direction, and *Ether* was discovered fifteen months after. The facts are rather amusing. Dr. Morton, a former pupil, and now successor to Wells, was visited by a man suffering from toothache, who had heard of the wonders of nitrous oxide, and insisted upon having the tooth out painlessly. Morton himself never used the gas, and so was unable to administer it, but like a true Yankee, he was equal to the emergency, and conceived the brilliant idea of borrowing one of the indiarubber bags, from which the gas was usually administered, and letting the man inhale atmospheric air from it. For this purpose, he went to the chemical laboratory of a Dr. Jackson, who suggested that Morton should let the man inhale sulphuric ether, asserting that this would produce real anæsthesia. Morton showed his entire ignorance of its properties, by asking if "ether was a powder." He was directed how to use it, and supplied with a small quantity, and finding it act as Jackson had said it would, went off and took out a patent for its use, disguising it under the name of Letheon.

These facts show clearly that Jackson and not Morton is entitled to the honour of the discovery. Morton now applied for and obtained permission to administer ether to a man about to undergo an operation in the Massachusett's General Hospital at Boston. The result was a complete success. The news quickly came to England, where Liston, on December 22nd, 1846, amputated a thigh at University College Hospital, from a patient under the influence of ether; this being the first operation performed under an anæsthetic in England.

In November, 1847, Professor Simpson, of Edinburgh, introduced chloroform, which quickly became more popular than ether in this country, though ether still holds its ground in America, and has now the preference even in England, from its greater safety.

Since then numerous other substances, chiefly belonging to the ethyllic and alcoholic radical series, have been experimented upon with more or less success; but to touch upon these or upon the question of mixed anæsthetics, is hopelessly impossible in a short *résumé* like this.

No anæsthetic has yet been proved to be absolutely safe, though the original one, nitrous oxide, in competent hands, attains as near that ideal as may be. And if we remember how closely the nervous and vital systems are commingled, we cannot but appreciate how slight and how ill defined is the border land between life and death, when both consciousness and physical sensibility have yielded to the insidious attack of the anæsthetic, and which is now fast approaching that vital part in the medulla, which once gained will cause immediate death.

The anæsthetics in general use, and which have therefore had their properties fully tested, are chloroform, ether, nitrous oxide and bichloride of methylene. Each of these possesses some advantages, and each possesses defects, so that the ideal anæsthetic has yet to be discovered.

Chloroform has many advantages; it is rapid and certain in its action, and is not unpleasant to the patient, but a great drawback to its use lies in the proved fact that it has a distinctly depressing effect on the heart.

Ether, on the contrary, has no such effect on the heart, but has an extremely irritating effect on the throat and lungs, and, in addition, is slower and more uncertain in its action. The difference between the two has been aptly compared to that between a slow and an express train. The express arrives at its destination quicker and with more punctuality, and the slow train is supposed to be safer.

Bichloride of Methylene, originally suggested as an anæsthetic by Dr. Richardson, has been extensively used, especially at Guy's, and the Moorfields Opthalmic Hospitals. Its advantages over chloroform are said to be a greater rapidity of action, a complete and rapid recovery, and an absence of muscular rigidity, and of unpleasant after effects. Unlike nitrous oxide, the anæsthesia can be maintained for any length of time, but, if for longer than five minutes, vomiting may occur. Several deaths have caused it to be looked upon with suspicion. It gives but little warning in fatal cases, and Dr. Richardson, by experiments on animals, has found that the heart's action and respiration cease at the same time.

Nitrous oxide, as we know, is best suited for Dental and other minor surgical operations, though, if need be, the patient can be kept under its influence for twenty or thirty minutes.

The *administration* of anæsthetics needs a few preliminary precautions. The patient should be placed in a warm room, and, if the operation will admit, in a recumbent position. Care should be taken that nothing tight is worn round the body that might interfere with abdominal respiration, and that the patient has had no food for three or four hours previously. *Chloroform* may be administered, either from a special inhaler, or from a piece of lint folded into a convenient shape, saturated with about a drachm of the liquid. The lint must on no account be placed too close to the patient's mouth, especially at first, as it is essential that a considerable quantity of air should dilute the chloroform. The proportion recommended, where it can be calculated, as in Snow's Inhaler, is only about 5 per cent. of chloroform.

The first effect of all anæsthetics is to stimulate the heart's action and augment the force of its contractions, which we shall be able to trace at the pulse. This may be partly due to the nervous excitement of the patient.

In the second stage there is no longer perfect consciousness, and the patient is in a condition of deep or drunken drowsiness with or without excitement. If the administration be continued he will quickly pass into the third stage of profound sleep, in which all voluntary motion and sensation are suspended. The pupil is contracted, and the breathing slow, as in natural sleep. The eyelids, however, still wink if touched, showing that reflex movements are still performed. The time required to produce this condition is never less than three or four minutes.

The fourth stage of perfect insensibility, or true anæsthesia, is marked by an absence of reflex movement, and the muscles are perfectly relaxed. The very beginning of this stage is the right time to commence surgical operations.

The fifth stage approaches the condition known as coma, and is marked by a tendency of the pupil to dilate, by slower, more laboured and stertorous breathing. If the quantity of vapour be increased death must ensue.

The foregoing account of the different stages has been abbreviated from Druitt's "Surgeon's Vade Mecum," but of course we must remember that these stages run almost imperceptibly into each other, especially when such a potent agent as chloroform is being used, and that the patient must be carefully watched the whole time. With regard to the contraction and dilatation of the pupil during perfect chloroform anæsthesia, I find that there is a wide difference in the statements of physiologists. The contradiction may, perhaps, be accounted for by the fact that the effects of true chloroform anæsthesia, and of asphyxic anæsthesia are different, and that, therefore, a large or small proportion of air mixed with the chloroform will give vastly different results.

Ranke states, "That chloroform enters into chemical combination with the blood, causing a nutritive change in the nerve centres." It is, however, doubtful if a true chemical union with the blood actually takes place within the body.

Claude Bernard states, "That the albumen of the nerve cells is slightly coagulated during ordinary anæsthesia, but that in fatal cases of chloroform poisoning there was hardening of the nerve trunks and evident coagulation of the albumenoid tissues."

Druitt describes the action of chloroform as follows:—"It begins by affecting the mind and consciousness. In its smallest doses it stimulates, then disturbs, then suspends the mental operations. It next diminishes the power of the nerves in receiving and communicating, and of the brain in perceiving sensations, whether arising from within or without the body: hence it diminishes or abolishes the perception of pain. Next, it destroys the reflex action of the spinal cord, and, therefore, all involuntary motion; and lastly, it abolishes breathing, too, and death ensues from apnæa or breathlessness." The apnæa is caused by the chloroform having given the blood such a quality that the pulmonary capillaries are unable to pass it.

But a reference to any table of deaths from chloroform will show that death has generally occurred before this the natural ending could possibly have taken place, and we have therefore to investigate some of these causes.

Death may arise from coma, syncope, or apnæa.

Coma is an arrest of the functions of the brain and spinal cord. This occurs more especially in epileptics, and is characterised by stertorous breathing.

Apnœa, sometimes though incorrectly termed asphyxia, is death by suffocation, and will be better considered in relation with ether and nitrous oxide.

Syncope "is a sudden suspension of the heart's action accompanied by cessation of the functions of the organs of respiration, internal and external sensation, and voluntary motion, caused either by some derangement of the circulatory system, the nervous system, or of some other important parts of the body." Syncope, and its near ally shock, are by far the most usual causes of death under chloroform. Dr. Lauder Brunton has gone very fully into the question how far chloroform administered during operations is likely to cause death by syncope or shock. He reminds us that deaths on the operating table often occurred before the era of chloroform, and that then the death was rightly set down to the shock of the operation. Now, chloroform, though it does away with the shock of pain, cannot prevent the shock to the system caused by injury of important parts, and it is a fact that the pulse suddenly fails coincidently with the sawing through of the bone in amputations.

Syncope is really the result of an insufficient pressure in the arterioles. This may becaused either by the heart failing to pump sufficient blood into the vessels, or by some leak or weakness in those vessels breaking the continuity of the blood stream, and thus preventing the return of the blood to the heart.

The heart may be retarded, or altogether stopped, by the cardiac branch of the vagus. The vessels are usually kept in a tonic state of contraction by the vaso-motor nerves; but, if through any cause these nerves are unable to perform their proper function, the vessels will enlarge enormously in diameter, so that they will require a correspondingly large amount of blood to fill them up. This has all the bad effect of a serious hæmorrhage which, as we know, is sufficient to cause syncope. Again there are certain sensory nerves, especially the fifth nerve, which may set the vagus in action, and produce stoppage of the heart by acting reflexly through the medulla. But this fifth nerve also communicates through the cerebral hemispheres with the vaso-motor centres. Hence, any irritation to the fifth nerve, such as the extraction of a tooth, will be conveyed to the medulla, and here it will put into action the retarding influence of the vagus on the heart, and consequently less blood will be sent into the bloodvessels. But under ordinary circumstances the same irritation will cause the vaso-motor nerves to contract the vessels, and thus no great harm will ensue ; but under some conditions this compensating balance is lost.

A small dose of chloroform acts on the cerebral hemispheres first, and destroys the reflex action which contracts the vessels, while it leaves the ganglia at the base of the brain and medulla unaffected, and allows the reflex stoppage of the heart to go on as usual. Thus we get the heart sending a diminished supply of blood to the vessels just at the time they require an unusually large supply. A full dose, on the other hand, affects not only the cerebral hemispheres, but the ganglia and the medulla, and prevents any reflex action whatever. Therefore, a little chloroform is a dangerous thing, and it is, probably, largely owing to a general ignorance and neglect of this fact, that so many deaths have occurred in such slight, but painful, operations as the extraction of teeth and the evulsion of toe-nails. Another reason for the fatality attending its use in dental operations is, that the sitting posture is unfavourable for the return of the blood to the heart, and, therefore, favours syncope.

Ether is generally administered from a special inhaler. An impromptu one may easily be made by folding a towel into a large cone, into the apex of which a sponge, saturated with ether, should be placed. As is the case with chloroform, the vapour must be largely diluted with air, especially at first. It is well to remember that from two to six ounces of ether will be required to produce anæsthesia, whereas the same effect is produced by using only two drachms of chloroform. Chloroform takes about two minutes, but ether from six to ten minutes, to do its work.

The advantage that ether has over chloroform is its greater safety, owing to the fact that it is free from the fatal defect of the latter in retarding the action of the heart. Some authorities even state that it stimulates it. Unfortunately, it has such an irritating effect on the mucous membrane of the respiratory tract, that it is disagreeable to all, and positively dangerous to those suffering from various inflamed conditions of those parts. Deaths under ether are, probably, always due to apnæa. Dr. Dawson, of Leeds, in a paper on the subject, gives a table of nine deaths, in which ether alone was held responsible for the occurrence ; and among these, in all the seven where there was a full report, the symptoms pointed to death from apnæa. We read of dusky, turgid, and livid faces ; never, that they were white or pale. Now, ether and chloroform, and, probably, nitrous oxide also, do not support respiration ; they prevent the necessary oxygenation of the blood, which means apnæa, if they are used in too large a proportion to air. But Dr. Dawson says that this could not have happened in those cases, none of which show that oxygen was absent, most of the reporters stating that pure atmospheric air had been breathed for some time previous to death. He considers "that the asphyxia is the result of the insufficiency of the circulatory action of the blood in the capillaries of the lungs to do their share in carrying on the respiration." What obstructs this circulation? Dawson answers, that it is the contractile effect of cold on the lung capillaries, produced by a re-evaporation of the gas as it passes out of the system where it has been in a fluid state; and that this loss of heat can only be compensated for by warm air entering in, and that a warm room is therefore essential for its safe administration.

This theory, though true, has evidently very little to do with actual death from ether. In the first place, we have the heat added to the body when the vapour is absorbed; and, secondly, when we consider how lasting are the after effects of ether we shall be loth to believe that it can be re-evaporated in a sufficiently short time to cause any sudden and important loss of heat. A more probable cause of the asphyxia lies in the fact that the sponge or towel used often becomes wet through with the watery vapour, and, thus forming a perfectly air-tight covering to the mouth and nose, prevent a due admixture of oxygen with the ether, and thus cause death.

Nitrous Oxide Gas is so familiar to all of us in its visible properties, that I only propose to say a few words about its supposed physiological action. I say supposed, because no anæsthetic has given rise to such diametrically opposed views on the subject.

Many observers, including Dr. Richardson, noticing the livid colour of the patient's face, the peculiarly rapid action of the gas in inducing anæsthesia, and, still more, the wonderfully short space of time in which it and all its effects are eliminated from the system on again admitting the air, have laboured to prove that the effects it produces are simply and solely the result of asphyxia.

MM. Jolyet and Blanche found that pure nitrous oxide extinguished sensibility in a guinea-pig in 2 minutes and 20 seconds, and life 10 seconds after that. In another experiment on a rabbit they found that sensibility existed after 2 minutes and 24 seconds; at that moment respiration abruptly terminated, the animal recovering after some moments of artificial respiration. They noticed that anæsthesia occurred at the moment the arterial blood turned black, and, quoting Paul Bert to prove that anæsthesia can be induced by asphyxia alone, when only 2 or 3 per cent. of oxygen is left in the arterial blood, say that the anæsthesia produced in these animals is produced simply and solely by a deficiency in oxygen. They then make further experiments to prove that nitrous oxide does not exercise any specific influence on the brain. In these they mixed sufficient oxygen with the nitrous oxide to prevent apnæa, and found that animals were able to breathe an artificial atmosphere composed of one part of oxygen to four of nitrous oxide, during a time sufficiently long, without manifesting any peculiar phenomena, and above all without exhibiting any anæsthesia. They, therefore, arrive at the conclusion, "that the protoxide of nitrogen being an irrespirable gas, and possessing none of the anæsthetic properties attributed to it, its employment can only be dangerous, and should, therefore, be proscribed from medical practice."

Does our daily experience lead us to accept this last statement? Unanimously we answer, no! The fact is, that nitrous oxide does exercise a specific influence on the brain. For if it were simply apnæa that produces anæsthesia, then nitrogen would produce the same results; but this is not so. Nitrous oxide produces a distinctly exhilarating influence on the system, whereas nitrogen produces a depression of spirits, accompanied by a feeling of suffocation, and takes much longer time to produce insensibility. Again, mixing oxygen with nitrous oxide must produce a new compound, not the N_2O of which we know the properties. In the present state of our knowledge we have to believe that the anæsthetic effects of nitrous oxide gas are produced primarily by a direct action upon the nerve centres, but also by an interference with the due oxygenation of the blood, and that death may occur either from coma, syncope, or apnæ.

There is one rather important practical point that I should like to have discussed this evening, and that is with regard to the use of the supplemental bag, to allow the atmosphere from the lungs to be breathed again and again. If it really is entirely pure nitrous oxide that is then used no objection can be raised, but I cannot help believing that such gas is always largely composed of carbonic acid gas, and I do not think the anæsthesia of apnæa is safe or desirable. I think that the tap of that bag is, as a rule, turned on too soon, and that I have noticed that patients go off more quickly if the supplementary bag be not used at all.

Many other anæsthetics I should like to touch upon if there were time. Prominent among those least known being hydrobromic ether, found satisfactory by Dr. Turnbull, of Philadelphia. Its great advantage being that it is rapidly eliminated from the system by the lungs. Also ethidene dichloride, used in a few cases by Mr. Bird, who advocates its use for children. "It very much resembles chloroform in its action, but has a pleasanter smell, and there is less excitement and vomiting, and the recovery is more rapid, unaccompanied by after effects, and is altogether less dangerous."—(Steffin.)

The Dangerous Symptoms that may arise during the administration of anæsthetics are roughly:—

Stertorous or very feeble breathing.

Convulsions. Livid or pale countenance.

Feeble or intermittent pulse.

The first thing to be done on dangerous symptoms appearing is to immediately stop the administration till they have passed away, and if they have been alarming not to resume it again. If the pulse is weak, slip brandy and water between the lips.

Should the symptoms be more serious, place the head slightly below the body. Draw the tongue forward in order to prevent by reflex action the closure of the glottis. Dash cold water freely over the face and chest.

If the heart symptoms are predominant place a few drops of nitrite of amyl on a pocket handkerchief and hold it beneath the nose. Nitrite of amyl is a powerful stimulant to the heart's action, and is considered the best antidote to chloroform poisoning we have.

If the heart should cease beating, a cloth dipped in hot water placed over the heart may restimulate it into activity.

It has been proposed to prick the apex of the heart with a needle, in order to excite the wished-for contraction.

If respiration ceases, artificial respiration must be resorted to, and continued for some length of time. I have not time to describe the chief methods used for this purpose, and I regret it the less as I remember that Mr. Pidgeon, in his admirable paper on "Surgical Emergencies," read last season, went fully into it, and I think Dr. Elliott, too, gave us a lecture on the subject.

In Dental operations we must always bear in mind the possibility of blood or a tooth having got into the air passage, and thus endangering life.

Before sitting down I beg to thank you for your kind attention during the reading of what, I fear, has been an extremely tedious paper, and to hope that my subject, in spite of its maltreatment at my hands, has proved not altogether uninteresting and useful to those of us who, from the large demands made on our time by examination subjects, have not yet found time to study anæsthetics.

DEATHS FROM ANÆSTHETICS.

Dr. Ernest H. Jacob, Leeds, communicates the following to the *British Medical Journal*:—

When I last addressed you on the subject of deaths from anæsthetics, about fourteen months ago, it was to call attention to the appalling frequency with which deaths from chloroform were occurring during the latter months of 1880. After an interval remarkably free from accidents due to anæsthetics, they are again recurring with even greater rapidity than in 1880. Since January of last year, there have been recorded in the British Isles nine deaths from chloroform (five of which have occurred in the past five weeks), four from ether, one from a mixture of ether and chloroform, and one from ethidene. I append below a tabulated statement of the cases. It will be seen that one of the accidents from ether was due to the blocking of a bronchus by vomited matter, and was only indirectly due to the anæsthetic. It is also noteworthy that, in two other of the deaths from ether, the kidneys were diseased. This state is recorded in necropsies of a large number of cases of death from ether, and appears to take the place of the "fatty heart" so often found after death by chloroform. Of the chloroform deaths, two only appeared to have occurred after operation of any severity; and, in one of these, death took place so long after the operation, that some doubt may justly be held as to how far the anæsthetic was an active agent in the result.

DEATHS FROM CHLOROFORM.

January 1881 *to February* 1882.

No.	Sex.	Age.	Place.	Operation.	Mode of Death, *Post Mortem* Examination, and Remarks.
1	M.	60	Bradford Eye Infirmary.	Cataract.	Asphyxia.
2	M.	55	St. Mary's Hospital.	Dislocation of shoulder.	Considerable fatty change in heart; lungs congested.
3	F.	19	Swansea.	Removal of uterine tumour.	Exhaustion after an hour and three-quarters' anæsthesia.
4	—	—	London	—	No particulars.
5	M.	27	Sussex County Hospital.	Fracture of leg.	Syncope; advanced fatty change in heart.
6	M.	9	Pendlebury Children's Hospital.	Abscess of thigh.	Died fifteen minutes after recovery from anæsthesia.
7	M.	54	Royal Free Hospital.	Dislocation of shoulder.	Syncope. *Post mortem* examination. "Might have died at any moment."
8	M.	51	Malvern Wells.	Dislocation of shoulder.	
9	M.	—	Broughton Ferry.	Operation for ophthalmia.	

DEATHS FROM ETHER.

No.	Sex.	Age.	Place.	Operation.	Mode of Death, *Post Mortem* Examination, and Remarks.
1	M.	45	Seamen's Hospital.	Hernia.	"Pulse and respiration ceased." Granular kidney and dilated heart.
2	F.	50	Addenbrooke's.	Tumour of jaw.	Asphyxia. Much hæmorrhage; cancer in lungs and liver.
3	M.	43	Guy's Hospital.	Abscess of hand.	Respiration ceased. Heart and kidneys enlarged.
4	—	—	London Hospital.	Wound of wrist.	Blockage of bronchus by vomited matter.

DEATH FROM CHLOROFORM AND ETHER.

No.	Sex.	Age.	Place.	Operation.	Mode of Death, *Post Mortem* Examination, and Remarks.
1	M.	19	Gt. Northern Hospital.	Evulsion of toe-nail.	"Died after the operation."

DEATH FROM ETHIDENE.

No.	Sex.	Age.	Place.	Operation.	Mode of Death, *Post Mortem* Examination, and Remarks.
1	M.	45	Gen. Hospital, Birmingham.	Empyema.	Pulse and respiration failed.

ALVEOLAR ABSCESS.

By M. S. Dean, Chicago.

(*From the Transactions of the Medical Congress*).

Mr. President and Gentlemen,—The causes of alveolar abscess and its pathology have been so minutely .and accurately described by several learned authors, that it would only be a waste of time for me to dwell upon the etiology of this disease, or upon its history. I will, however, state at the outset that I shall denominate as alveolar abscess no lesion except that which is associated with a tooth, the pulp of which has become devitalized ; no matter whether the devitalization be of recent or remote occurrence. In other words, the death of the pulp will be regarded as the remote or indirect cause of the disease. The immediate or exciting causes, then, of alveolar abscess (properly so-called) are—the various matters and their products that find their way from the root canal, through the apical foramen. These irritating agents may arise either from the decomposition of the pulp tissues, or, at a later period, of the exudations that may have entered the canal through the apical foramen, or from the matters that may have entered the root canal from external sources ; or, indeed, in some cases even, from the passage of liquids or gases through the canaliculi of the dentine and cement of the root. Any of these agencies, acting mechanically or septically upon the tissues surrounding the root, would cause inflammation, and, as a consequence, might terminate in alveolar abscess.

This is a very general statement, indeed, of the causes of the lesion which is made the subject of this paper. To trace its progress from its incipiency to its climax, would be, as before intimated, only a waste of time, since its different progressive stages are well known to every dental pathologist.

The pathogeny of this disease being thus condensed within these narrow limits, it remains only for me to proceed to the practical question, its treatment. I shall in this confine myself to a few of the ordinary cases that are of the most frequent occurrence, of which some are regarded by many writers as incurable, and, unfortunately, are treated as such by many practitioners.

Alveolar abscess, with fistulous outlets, whether of long standing or recent development, are the least difficult to treat, and are the most speedily brought to a favourable termination. Indeed, the treatment of such cases is exceedingly simple ; and if the remedial agent is properly and thoroughly applied, a single operation usually results in a permanent cure. To illustrate the mode of treatment in detail, we will take an example in practice. A fistulous abscess associated with a superior bicuspid having a large cavity on its distal surface—the gums somewhat inflamed and turgid. The first step in the treatment of this case—whether the abscess be acute or chronic—consists in adjusting the rubber dam to this and to the adjacent posterior tooth—if there be such. The decayed parts should then be removed, and a convenient entrance made into the root canal or canals, which should be enlarged, if necessary, with a Gates' drill, or other instruments suitable for that purpose, and thoroughly cleansed. A steel broach should then be passed gently through the apical foramen to remove any obstruction to the passage of liquids. This last operation sometimes requires considerable patience, especially so when the end of the root is somewhat curved. The next process consists in the injection of creasote through the apical foramen into the abscess. This operation should not be discontinued until the whitened orifice of the fistula gives evidence that the remedy has reached this point.

A simple method of accomplishing this, and one that has proved entirely satisfactory to myself and to others, is this: Fill the root-canal with a light pledget of cotton, saturated with creasote; then introduce a soft ball of vulcanite into the cavity of decay; now, with a few quick and forcible impulsions, with a round-headed instrument upon the soft rubber, the creasote will be forced through the apical foramen and the mouth of the fistula. The injection of the abscess and fistulous tract having been accomplished, the root, canal or canals, may now be filled tightly with cotton, slightly moistened with creasote, and the cavity of decay sealed up so securely as to prevent the entrance of the fluids of the mouth. If the details of this simple operation are carefully carried out, no additional treatment will be necessary, in a great majority of cases, to effect a permanent cure.

After the lapse of five or six days, the fistula will be found closed, and the pulp canal should now be completely filled with some durable and impervious material. But before the temporary stopping is removed, the rubber dam should again be applied to the tooth in order to prevent the possibility of any contaminating matter entering the root canals. This last point is so essential that I wish to strongly emphasise it here; for a successful result would generally, if not always, be thwarted by any infectious matter—the fluids of the mouth even—that might enter the root-canals subsequent to the first step in the treatment of the case. No matter how badly broken down the crown of the tooth may be, or swollen the surrounding parts—an alveolar abscess of the character just described will readily yield to the treatment above indicated—as a rule.

The treatment of the teeth anterior to the bicuspids is, in some respects, still more simple; the roots being straight, and the canals more cylindrical. In these teeth it is sometimes better—if not too much weakened thereby—to make a direct opening into the canal from the lingual aspect. In other respects, the treatment of these teeth is the same as in the case just described. It is hardly necessary for me to state that this treatment applies equally well to abscessed roots upon which artificial crowns are to be secured.

The treatment of fistulous abscesses, that are associated with the molar teeth, is somewhat more complicated, inasmuch as it is more difficult to obtain free access to the root-canals; but when these are once opened up, a cure is quite easily effected by adopting, essentially, the same method as that described for the single-rooted tooth.

In the foregoing, I have had in view those alveolar abscesses in which fistulous openings had been already established. We will now briefly consider the treatment of those abscesses which are generally far more difficult to manage. Having no fistulous outlets, they are sometimes called "blind" abscesses; some of these yield readily to treatment, especially if they are not of long standing, yet they require more cautious management. The cavities of decay and root-canals should be cleansed, as in the cases just cited, but greater care should be exercised in the manipulation, lest some of the *débris* be forced through the apical foramen. It will be readily seen that this care is more necessary in the treatment of the lower teeth than of the upper. After the operation of cleansing the cavity and root-canals is completed, if the pus does not already flow into the canal, a broach should be passed through the foramen, and the pus and serum that follow the withdrawal of the instrument should be removed or wiped out until it ceases. Then make a piston by winding cotton around a suitable instrument—the head of a Gates-drill does very well—and saturate it with eucalyptus oil or phénol sodique. With this is much of the pus as possible should be forced or pumped from the abscess. Of course, the cotton should be removed from the instrument and renewed many times. By this means the remedial agent will be forced through the foramen and drawn out again, bringing with it a mixture of purulent matter. By repeating this operation several times, nearly all the contents of the sac will be removed. I prefer the eucalyptus oil or phénol sodique to creasote or carbolic acid in this operation, because the latter, by coagulating the albuminous ingredients of the pus, affect its fluidity, and thus increase the difficulty of drawing it through the apical foramen. After the contents of the sac are measurably exhausted, a little creasote may be injected into the abscess, and the root, or roots, be filled with a light pellet of cotton, and the cavity be sealed up. If there is not a sufficient quantity of creasote in the canals to saturate the cotton, a little should be added. On the second or third day subsequent to this treatment the temporary stopping, and the dressing in the canals, should be removed. To a practised eye, the appearance of the dressing taken from the canals will often indicate the condition of the parts beyond the apex. If pus should be found in the meshes of the cotton, or if serous fluid, or pus in small quantities, should in a few minutes ooze through the apical foramen, or, if we find there has been a leakage of the temporary stopping, the same treatment should be repeated. The second treatment will, as a rule, be sufficient to cure the abscess. But, in most cases, I would advise the removal of the second dressing after about a week's time, and again to pack the root-canals tightly with cotton moistened with creasote; and then to securely fill the remaining cavity with a trial filling that might remain for a month or more.

This is all the treatment that is required to cure the great majority of cases of this class. But occasionally we meet with a case that will not yield so readily. In such a case, after a faithful course of treatment with creasote and eucalyptus, has proved ineffectual, it would be well to substitute aromatic sulphuric acid. The effect of this remedy in these stubborn cases, though somewhat painful, is often truly wonderful; and one application is frequently sufficient to arrest the secretion of pus. The subsequent treatment would be the same as that adopted in milder cases. In some of these cases—especially those of long standing—when the external wall of the abscess has become thin and yielding, the quickest, and, perhaps, the least painful, method to pursue, would be to produce an artificial fistula with a trephine, or any other instrument.

The lesions may be then treated as before described for fistulous abscesses. Of course, if there be necrosis of the osseous parts, the removal of the sequestrum, and the substitution of aromatic sulphuric acid, will be indicated, and will generally result in a speedy cure.

Abscesses, with fistulæ opening externally upon the face, yield readily to this treatment, without the loss of the teeth that are associated with them. Even those of many years' standing, may often be cured by a single injection of creasote or carbolic acid. You are all aware that abscesses of this nature quite frequently arise from the death of the pulp in the inferior incisors that are entirely free from decay; the cause being frequently overlooked by the medical, and sometimes even, by the dental, practitioner. Cases of this kind, which had been treated externally for a series of years, have come under the observation of many of you. By applying the same principles recommended in the first case described, an abscess of this character may be cured almost invariably by an operation requiring thirty minutes', or, at most, an hour's time, and the tooth retained in its usefulness.

Perhaps it may not be amiss, here, for me to suggest that the opening should be made posterior to the cutting edge of the tooth (I speak of the inferior incisors), and in as direct a line as practicable with the longitudinal axis of the root-canal. This is easily accomplished by the aid of the dental engine, and a right-angle attachment armed with a triangular spear-pointed drill, having a small and slightly flexible shank. I need not detain you with the further details of this operation, as they have been fully suggested by the foregoing treatment of the bicuspid. I will bring this imperfect sketch of the details in practice to a close after a few words concerning the treatment of incipient alveolar abscess. Of course, it is often difficult to distinguish an incipient abscess from periostitis when the latter is occasioned by the mephitic gases or other irritating matters that find their way through the apical foramen. But this is of no practical importance, since the same treatment that is adopted for the one is applicable to the other. In cases of incipient abscess, the rubber dam should be applied as in the cases before-named, and after having removed the parts softened by decay, the dead pulp or other matter should be carefully removed from the canal. It would be better not to thoroughly remove the *débris* at the first sitting, lest in the attempt to do this we force matter through the foramen, and thus aggravate, rather than ameliorate, the trouble. After this partial cleansing of the cavity, a pledget of cotton, saturated with eucalyptus, or dilute creasote, should be delicately introduced into the canal, and the cavity sealed up with cotton and sandarach varnish. In this operation, pressure should be carefully avoided. The margins of the surrounding gums should then be touched with a solution of iodine in creasote. This may be conveniently done with a small spatula that will pass between the circumjacent gums and the neck of the tooth. After three to five days, the cavity of decay, and the root-canals, should be thoroughly cleansed, and the latter now filled densely with cotton, moistened with a little creasote, and the former with gutta-percha, or some other impervious material. For an incipient abscess—or periodontitis from the cause already named—this treatment will (with very careful manipulation) generally prove all-sufficient. It is, of course, understood that the fluids of the mouth must be absolutely excluded from the cavity, from the commencement of the treatment until the cavity is permanently filled.

ARTIFICIAL LIGHT.

Prof. W. H. Pickering, Boston, U.S.A., writes an article in *Nature*, concerning the gas-flame, electric, and solar spectra, and their effects on the eye. He refers to an account of some of his experiments on these subjects, which is to be found in the "Proceedings of the American Academy of Sciences for 1880," p. 236. In that article, it was shown that the colour of the sun was not what the average person would call white, but decidedly blueish. If the highly magnified images of two diaphragms *equally* illuminated, one by the electric light and one by the sun, be cast upon a screen, the distinctly blueish character of the latter will be strongly marked. Indeed, the magnesium light is more blue than the electric, and hence, probably, is of a higher temperature, although being spread through a larger space, has less available heating power. As far as mere colour is concerned, then, the electric light approaches nearer to the sun than does the gas-flame.

From subsequent experiments, however, Prof. Pickering now writes, it is my impression that colour has nothing whatever to do with the painful effects sometimes noticed in the eyes, after long and continuous work by artificial light. To test this question, I had a tin lamp-shade constructed, consisting of a tube six inches in diameter by eight in length. One end was closed by a reflector, and the other by a piece of very light blue glass. Two holes were made in the sides, through which passed the glass chimney of an Argand gas-burner. By experimenting with a shadow photometer, a position was found where the light received on a book was of the same intensity, and very similar colour, to that from a window in the day-time, at a distance of about six feet. A few minutes' reading, however, was sufficient to convince me that the new light was far more trying to the eyes than an ordinary gas-flame would be. The ill-effects being due to the intense heat thrown down by the reflector. And this, I think, is the source of the whole trouble in the ordinary gas-burner. The heat radiated by the flame, the heated chimney and shade, and reflected from the printed page, and all other white paper lying on the table, dries the eyes, the lids, the forehead, and temples. Temporary relief may be found by bathing the face and eyes in water, but it is only temporary. The hot, dry air about the lamp is also harmful, and no doubt contributes its share of injury to the vision. These evils may both in part be remedied by placing a pane of glass so as to intercept the rays from the lamp before they strike on the book or the face. But it must be placed at such a distance from the lamp as not itself to become heated.

The hotter the flame, the whiter it is, and the more light is thrown off in proportion to the heat. Hence oculists are recommending such lights as the Student's and Moderator lamps, which burn with a small, hot, and very brilliant flame, as compared with that furnished by the Argand and fish-tail burners. We learn from statistics how alarmingly prevalent near-sightedness has become of late among students. Hence anything which will tend in the future to prevent this wide-spread defect will be a boon to mankind. And here is where the particular advantages of electricity come to the front. The fact that there are no gaseous products to radiate heat without light, taken together with the high temperature of the incandescent carbon, unite to give us the maximum of light with the minimum of heat. The ever-varying intensity of the arc light is at present a strong objection to it, but we may look forward to the success of the light from the incandescent carbon strip, in the near future, with the assurance that we shall soon have a remedy for the most widespread evil that afflicts the human vision.

CASES OF HARE-LIP.

(*Concluded from page* 31.)

Horrid Complicated Single Hare-lip; single fissure on the left side, through hard and soft palate, very wide in front, the gap freely admitting the thumb, and this space being due to the remarkable way in which the united ossa incisiva attached to the right superior maxillary bone stood prominently, almost straight, forward, and even above and to the right of the tip of the nose; cured without deformity:—

J. C., aged one year and nine months, first child, born with horrid complicated hare-lip, right maxilla projecting with intermaxillary bones almost prominently forwards; the left maxilla scarcely developed at all—so leaving an enormous gap, the palate being cleft through, hard and soft. The nose, owing to this arrangement, was entirely dragged and flattened on the left side—spread out even on the cheek. The gap in the hard palate was greater than I have usually seen, where only one fissure existed, fully admitting the thumb into it. The whole emaciated and attenuated condition of the little creature was most pitiable when I saw it, four or five weeks after birth—the parents, as usual in such terrible and revolting cases, at once seeking for some operative interference to humanise the deformity. When I saw the child, at this early period after birth, it was barely existing, and the idea of any operation then was out of the question, though I am partial to and sustain the good results of early operation *when practicable;* but the practical surgeon can follow no rule in this respect. It may be very gratifying to parents to try and have an operation performed, hoping always that it must succeed, but the surgeon who has largely dealt in such matters, knows well the risks of failure when life is scarcely exerting its proper influences over the nutriment, growth, and development of the little child. At this time I dissuaded the parents from any operation, and now the child has been presented to me again for operation several times since I first saw it and was consulted as to the propriety of operating. On every occasion I advised putting off the time until the little creature gained strength, and now—February 4th—I have seen him again, and he has grown comparatively strong and healthy, though, as contrasted with other children of his age, he must be markedly small, thin, and puny. The face is really fearfully distorted, though there is no second fissure; the intermaxillary bone attached to the right supermaxillary has come to stand even far more prominently forward as they have been developed, and the effect thereby is far more hideous than when the child was a little infant—the first tooth protruding straight forwards, increasing this horrid deformity; and the constant thrusting of the tongue by the child out through the wide gap makes the whole appearance disgusting. The child being now two years old, and in good health, I determined on operating upon him.

On Feb. 5, 1880, at 11 a.m., I operated upon him, after the following manner, assisted by Dr. Denham and Surgeon Wheeler:—The child being rolled up in a sheet, mummy-ways, was placed in the lap of a nurse, his head resting well up on her chest; an assistant, standing behind, steadied the head immovably in this position. I first thrust a tenaculum through the right half of the lip, just at the margin of the red border at its outer part, when, being connected with the white skin, I gave it to an assistant to hold; in a similar way I transfixed with a second tenaculum the left border of the lip, sunk down, depressed, and pinned in tightly to the undeveloped left maxilla, at a similar position to that on the right side—that is, where the curve ceased and the red lip joined with the white skin. Yet here the tenaculum was inserted steadily and accurately. This, too, was placed in the hands of an assistant. I now took the tenaculum on the right side from the assistant, and, having made traction forwards and outwards, revealed the mucous membrane, binding the lip to the jawbone and ossa incisiva. With a sharp narrow-bladed scalpel the soft parts were rapidly dissected up from the bones, and very extensively outwards, so as to allow the lip great freedom, and so expose extensively the projecting ossa intermaxillaria and the anterior edge of the perfectly developed superior maxilla. I next, with my lateral-bladed forceps, clipped across the bony projecting arch formed by the maxillary and united intermaxillary bones just at this junction. The instrument divided their junction a little above the alveolar range. I next cut, with the vertical cutting forceps, the pedicle connecting this prominent piece with the vomer. The projecting bony piece thus cut externally and above—the soft parts all around it uninjured owing to the construction of the forceps—was then caught in a pliers, the jaws of which were covered with two layers of chamois leather, so as to prevent bruising or excoriation, was bent back and forced from right to left into the gap, thus making the alveolar range perfect in form. The force brought to bear by the pliers was so steadily applied, and as close as possible to the osseous divisions, that the piece went back gently, without starting from their bed either of the pieces or the teeth. I then seized the tenaculum in the right part of the lip, and fixed its connection to the maxillary considerably backward, satisfying myself that it would come well over to the left side, and without much traction. This being satisfactorily arrived at, I then took hold of the tenaculum inserted in the left half of the lip, and lifted it upwards and outwards. It was necessary here to make a very extensive dissection. The left superior maxilla was so miserably developed that the lip was tied back more than a quarter of an inch, and the left ala of the nose completely flattened, spread out quite with an inclination *downwards* and *outwards*, and firmly bound to the bone. The dissecting up of the lip was very troublesome, so as to free it sufficiently to come forwards towards the right side, and the dissection of the spread out nostril from the bone required much caution, the division requiring to be effected close up to the inner angle of the eye. The parts being sufficiently freed, they were gently drawn over to meet those on the right side, and were found admirably adapted for apposition with the opposite side.

I then took in my left hand the tenaculum, thrust through the right side of the lip, drew it steadily forwards and a little inwards, making it quite tense. I then passed the curved scissors, that I am in the habit of using, beneath my left hand, laying the instrument, with its curve towards the mesial line, upon the lip, close to the outer surface of the inserted tenaculum, pressing, at the same time, the instrument well up, so that its points should be within the nostril when the division of the lip was accomplished. The instrument being thus steadied in its proper site was firmly and rapidly closed, dividing at one stroke all that was required to be taken away, and thus cutting out the tenaculum with the soft parts. In a similar way I lifted upward and a little inwards the left tenaculum, so making tense the left portion of the lip; to this, also, the curved scissors was applied at the outer surface of the tenaculum, and the soft parts cut away up into the nostrils. There was scarcely any blood lost, pressure being effectually made on the facial artery on either side. The two concave surfaces, when thus approximated, fitted together most evenly from the nostril to the lower edge of the red border. The first needle I inserted a quarter of an inch external to the left ala of the nose, and on a line with its lower edge. This was made to travel from left to right through the thickness of the lip, until it appeared on its cut edge close to the mucous membrane. It was thrust on so as to strike the cut edge of the opposite side, close to the mucous membrane, and so on until its point appeared on a line with the right ala of the nose, and at a similar distance from the cut edge to that on the opposite side. The needle lay perfectly straight across, the parts were pressed from behind forwards towards each other upon the needle, and they came most evenly together with scarcely any strain; and it was most remarkable how beautifully the left half of the nose, which was so distorted and spread out, at once came up into symmetry with that on the right side. A few turns of silk thread were cast in figure of 8 form around the needle, the parts being well forced in upon the needle in very accurate contact before the thread was thrown round, so as to prevent their receding again; thus there was no sharp pressure made by the cord. The second needle was inserted at a similar distance from the cut margin as the first, and exactly at the junction of the skin and red border of the lip on the left side, and made to travel through the lip close to the mucous membrane to the opposite side, and enter exactly in a corresponding position, and made to appear above the red margin at the same distance from the cut surface as that on the opposite side. The cheeks were shoved from behind forwards, and the surfaces pressed closely and evenly together. Nothing could be more perfect than the way in which they lay together. I was most particular in throwing the cord about the needle in the figure of 8 form, so as not to strangle the tender soft parts over the needle. Each turn of the cord was made to lie most evenly, the *first being from above*, and so on alternately until the cut red border was nicely covered and supported. The third needle was placed between both, and the cord cast around it with similar precautions to those already used. The ligature around the first needle was then turned a few more times, in order to give a wider support. The ends of the needles were then cut off with pliers, and a narrow bit of sticking plaster placed between the clipped edges and the skin on either side. Then the cheeks were well pressed forwards, and I applied, as my usual custom, a large piece of sticking plaster, hollowed beneath, to go under the chin, and the wide portions passed upwards to the temple on either side, and so restraining the cheeks from going backwards again; by this means all tension was removed from the needles.

I put the child at once on small doses of opium. The following is the form which I have adopted for many years:—℞. Tinct. opii gutt. x., olei anisi gutt. x., syrup alb. ʒiii., aquæ ad ℥ii.; a teaspoonful every third hour until quiet and dozing are secured.

6th.—Child took abundance of warm milk, and slept lightly and quietly from the administration of the mixture: no crying; parts all look very well.

7th and 8th.—Child going on most favourably; swelling considerably abated, and takes quantities of milk; also continues the sedative mixture.

9th.—Removed needles this day. Ninety-six hours after the operation, having, as in the previous case, given nearly a double dose of the opium mixture to quiet the child, the entire wound healed most evenly and beautifully throughout, from within the nostril to the very lowest point of the red margin, and the red lip naturally pouting (no notch), from the admirable way the concave wounds lay together, and thus projecting slightly the lowest border of the lip. Applied several straps of plaster to sustain parts together, pressure being made upon the cheeks, forcing them forward during the entire dressing. The wide piece of plaster was then applied, as before stated, to take the place of the assistant's hands in keeping the cheeks forward, and relaxing the parts external to the united wound. The child all through the day took milk freely and his bottle occasionally.

10th.—On calling to see the child this morning at ten o'clock, I was at once told that one of the servants went in to play with the little fellow when his nurse was away, and he was forced into a fit of laughing, and in the effort he opened the lower part of the wound in the red border, and it bled very freely. In order to rectify the mischief I cleansed away all blood, refreshed the edges of the gaping little bit, and passed a needle from left to right, just at the juncture of the red border and the skin, and a little external to the point first selected. This was carried across to a corresponding point on the opposite side, and a silken thread thrown most cautiously around it in figure of 8 form; this brought the surfaces most accurately together. A couple of narrow straps were placed between this suture and the nose, so as to support the lip above; the wide strap was then put on to maintain the cheeks forward as before. Visited at 3 and 8 p.m.; child has taken quantities of milk, and also his bottle, has been kept perfectly quiet, and sleeping lightly all day. The lip looks perfectly glued together.

11th.—The child slept quietly, the mixture being administered every fourth hour, and drank nearly a quart of hot milk through the night; the little creature is quiet, and the edges of the lip seem glued together; no gap whatever beneath, and there is no tension on the needle.

On the 14th—ninety-six hours after the insertion of the needle to rectify the mischief that had been done—I carefully withdrew it; the threads been adherent lightly I let them remain, and placed the strap under the chin from temple to temple to keep cheeks forward, and a single strap across.

15th.—Removed all, and found the union perfect throughout from the nostril to the lowest part of the red border of the lip—in fact, it was most remarkable how such perfect union was obtained after the violence which tore open the wound after its first perfect cohesion.

17th.—The union now is everything that could be desired; the nose is perfectly straight—no twist on either side—the upper lip is perfect throughout, the union of opposite sides being most accurately accomplished; and, when the little creature smiles, the little incisor milk-white teeth appear in their natural curve, proving above all things the necessity for preserving the intermaxillary bones with the little teeth. This, however, cannot be done by violence ; the osseous piece between the intermaxillary bone and the maxilla must be all cut through with my instrument, and the osseous ridges from the vomer likewise perfectly, before force should be applied to turn it into the gap towards the opposite maxillary bone. If the osseous attachments are correctly divided, the force required to turn over the projecting piece into the place that it should occupy will be so trifling that the little teeth, or the source from which they spring, will not be interfered with or damaged. So it was in this very remarkable case. The parts are again well sustained and supported together by adhesive straps, so as to take off muscular action from any traction on the recently-united parts.

20th.—All straps now removed, and nothing could prove more successful than the operation. The nose is perfect, not in the least degree flattened or dragged, the lips are beautifully united throughout to the very lowest edges, and, at a little distance, the marks of the operation are scarcely perceptible. When the child smiles, the mouth is quite evenly drawn upon, and there is not the least deformity left.

PLYMOUTH DENTAL DISPENSARY.

The Annual Meeting of this Dispensary was held on the 15th of November, 1881, and the following Report was submitted and approved :—

Last year the Annual Meeting was held under critical circumstances, and it was a question whether the Institution could be sustained. An appeal, however, to the public elicited an answer which shows that where useful and gratuitous help is provided for the poor, the necessary funds will be forthcoming where needed.

The result of the appeal was that the Subscription List was raised from £7 to £26, and Donations to £2 14*s*. 6*d*. Special Donations of £8 11*s*. 6*d*. enabled the Committee to provide needful relief for the patients in attendance.

The Dispensary is now open every week-day ; more commodious rooms have been taken ; and means are adopted for mitigating pain so far as possible ; and a fire will be provided, when necessary, during the winter months, in the waiting-rooms.

The work during the past year is as follows :—

	1880.	1881.
Teeth extracted	1,702	1,702
Filled with gold	1	2
„ amalgam	93	87
Other operations	77	121
	1,873	1,912

The receipts for the year were £37 7*s*., and the expenses £29 19*s*. 3*d*., leaving a balance in hand of seven guineas.

EDINBURGH DENTAL HOSPITAL.

The Annual Meeting of the Edinburgh Dental Hospital and School was held within the Hospital, No. 30, Chambers Street, Edinburgh, on 25th January, 1882, the chair being occupied by Dr. Alexander Peddie, Vice-President of the Royal College of Physicians.

The Office-Bearers having been elected for the ensuing year, the Secretary read the following Report of the Dental Staff, which, on the motion of the Chairman, was unanimously approved of:—

The Dental Staff of the Hospital and School have much pleasure in stating that the demands on their services show a steadily-increasing confidence and appreciation on the part of those classes for whose benefit the Institution was founded. They also submit to the consideration of the subscribers the following classified list of patients treated during the year, the number being—males, 2140; females, 2,503; total, 4,643;—

Bakers	20	Lamplighters	3
Barbers	9	Message Boys and Girls	181
Basketmakers	7	Masons	47
Brushmakers	7	Nurses	8
Blacksmiths and Brassfounders, &c.	80	Policemen	20
Bookbinders	105	Painters	35
Bootmakers	35	Plumbers	40
Brewers	13	Plasterers	13
Butchers	12	Post-Office Employees	44
Cabinetmakers	53	Polishers	11
Carters	17	Rubberworkers	19
Cabmen and Vanmen	48	Railway Servants	48
Coopers	16	Saddlers	12
Chemists	6	Shop Men	42
Confectioners	16	Shop Girls	59
Clerks	45	School Boys and Girls	493
Colliers	2	Slaters	10
Cutlers	4	Servant Girls	416
Corkcutters	3	Students and Teachers	22
Compositors and Printers	146	Tinsmiths	25
Children	166	Tailors	94
Drapers	14	Tobacconists	9
Dressmakers	54	Typefounders	39
Engineers, &c.	52	Turners	7
Grocers	30	Males (no occupation)	520
Gilders	8	Females ,,	545
Hatters	10	Married Females	622
Jewellers and Watchmakers	21	Total	4643
Joiners	58		
Labourers	202		

While, as with all such Institutions, more especially in their infancy, the cases of extraction have preponderated, the Dental Staff hope in time to educate the Hospital patients to a proper appreciation of value of their natural organs, and induce them to apply for relief before extraction is rendered imperative; and they are happy to report that, during the year, 425 teeth have been stopped (53 of these with gold), besides 151 cases receiving more general treatment, such as correction of irregularities, &c. In many of the operations, more especially when of an aggravated nature, chloroform and nitrous oxide have been exhibited, and in all cases with perfect success.

They have also to report that the additions made to the Hospital equipment, noticed in last year's report, have given complete satisfaction, and that further additions tending to more effective treatment are only delayed by the question of expense. This obstacle, they hope, will speedily be removed by the increased liberality of the public.

As an evidence of the appreciation of the service rendered at this Institution, they would particularly draw attention to the fact that the sum of £10 9*s*. has been voluntarily contributed during the year by the patients themselves, being an increase of fully £4 5*s*. over last year. This is a source of income which affords the Dental Staff much gratification.

The number of Students attending both Hospital practice and lectures has slightly increased, and must be regarded, considering the transitional state of Dental Education, as decidedly satisfactory.

They have also to express their satisfaction with the regularity of attendance of the Students, as also their conduct and progress.

A few Senior Medical Students have also availed themselves of the advantages to be derived from attendance at the Hospital practice.

The Directors have again to thank the Council of the Odonto-Chirurgical Society for the continued privilege the Students enjoy of having access to the Society's Library and Museum.

The Secretary also read the Account of Charge and Discharge, which, on the motion of Dr. Smith, was unanimously approved of: the Discharge amounting to £367 6*s*. 5½*d*., the Charge to £362 19*s*., and the balance due to the Treasurer to £4 7*s*. 5½*d*.

ODONTOLOGICAL SOCIETY.

The First Ordinary Monthly Meeting of this Society for the present session was held at 40, Leicester Square, on the 6th ultimo, when Mr. Samuel Lee Rymer, the newly-elected President, took the chair.

Mr. Sewill showed a model of the upper jaw of a child nine years of age, in which there was a supplemental lateral incisor. The two teeth were so much alike that it was impossible to determine which was the normal tooth. He proposed waiting until the canine showed itself before he interfered with the case. He also showed sections of an upper lateral, and of a lower bicuspid, protruding from the apical foramen of each of which was a portion of a pulp extractor. In each case acute periostitis existed, and he removed the tooth. A similar accident had happened to himself. A lady came to him, suffering from acute periostitis, the greater part of the pulp of the tooth having been destroyed by inflammation. To remove all remnants of the pulp, he passed up a nerve instrument; but finding that it would not come down, it consequently broke, and he had at last to extract the tooth. In most cases of the kind, he found that by binding a little cotton wool around another instrument, the broken piece could be removed. He next referred to a recent communication by Dr. Magitot to the *Académie de Médicine*, Paris, in which it was asserted that chronic alveolar periostitis, with absorption of the gums and alveoli, were conditions so constant in diabetic patients as to be of very great value in diagnosing diabetes. Mr. Sewill said that his own observations bore out those recorded by Dr. Magitot. One young woman, who suffered from acute diabetes, had lost some of her teeth, and others are being destroyed, by the rapid absorption of the alveoli. In another case, a lady who had suffered from that disease lost all her teeth before her death.

Mr. Sewill also mentioned the case of a young gentleman who, a few months ago, consulted him with regard to having a small cavity in an upper molar filled. He was about twenty years of age. After having made a few incisions in the soft dentine, he suddenly had a short fit, being strikingly of the form of epilepsy. The whole thing was over in half a minute, but from what could be observed, the convulsions seemed to be on the right side; his eyes were dilated, and his jaws clenched. The patient having recovered, Mr. Sewill went on with the operation, and another similar occurrence took place. The cavity was filled, and some few days later he returned, suffering from intense neuralgia in the branches of the dental nerve. The point he (Mr. Sewill) wished to notice was, that patients may have a small convulsion of some of the muscles, and yet all this time they may be suffering from epilepsy, which, later, may develop into a much larger form; and in these cases, for the sake of the patient, it should be made known, and the connection between dentistry and medicine strengthened.

Mr. COLEMAN had met with several cases of epilepsy due to dental irritation; some on the extraction of teeth, but none where nitrous oxide had been used.

Mr. TURNER had occasionally had the misfortune to break and leave part of a nerve extractor in a tooth, but where the pulp was removed, he did not see that any bad results need necessarily follow. The question relating to diabetes and the absorption of the alveoli was one of considerable gravity; but from his experience, he thought the coexistence of the two diseases one of coincidence, and not the one depending upon the other.

Mr. Moon, agreeing with Mr. Turner, thought that the dental disease mentioned and diabetes must be two distinct conditions. With regard to epilepsy, he mentioned the case of a girl who was taken into Guy's Hospital. She had been convulsed, and her mouth fixed, and she had been in an epileptic condition for over four and twenty hours. It was caused by the cutting of a wisdom tooth; for upon cutting the gum, her features were immediately released, and she went home looking quite well. The girl had been the subject of marked epilepsy for years, and after her teeth had been put in order—some extracted, others had pulps removed and were filled—there was no recurrence of the fits afterwards.

Mr. F. J. Bennett had found that by the use of nitric acid, applied on a little cotton to the broken barb in a root canal, and temporarily filling the cavity, he had in more than one case been successful.

After some remarks by Mr. Gaddes, Mr. Coleman, and Mr. Sewill,

Dr. Campbell, New York, exhibited his New Mode Heater, and described its chief features.

Mr. Browne-Mason exhibited, under the microscope, a section of gemminated molars.

The President then delivered his inaugural address. Having thanked the Society for electing him as president, the most distinguished honour which the profession had to bestow, he congratulated the Society in adopting the bye-law which permitted them to select their president once in three years, from among the country members, of whom there were many well qualified to fill the chair. In the earlier years of the Society's existence, it would have been exceedingly inconvenient for the president of the day to have been non-resident, when his services in the political conquest were constantly needed. He (Mr. Rymer) had a vivid recollection of the years of anxious toil which preceded the settlement of the questions then in suspense, and knew that the work necessitated such frequent meetings and important consultations as to render it imperative that the president should always be at hand ready for any emergency. But now the Odontological Society was, happily, no longer troubled with any political controversy. With meetings held at stated, convenient, and not too frequent intervals, and with the travelling facilities of the present day, country members might occupy the presidential chair with but little inconvenience to themselves, and none to the Society. He assured them that the compliment thus paid would be fully appreciated. The reform in the Dental profession has been so ably treated by Mr. Alfred Hill, and already described from that chair with such graphic and impartial accuracy as to render it unnecessary for him to take up time with any lengthened allusion to the Reform Movement of 1856, or to the history of the subsequent proceedings. But there was one important event which, he thought, might be rendered clearer by a slight explanation, viz., the amalgamation of the Odontological Society with the College of Dentists. The announcement of the fact that the College of Surgeons, after long deliberations, had come to the conclusion that it would tend to the public advantage to grant diplomas in Dental Surgery, the publication of a code of regulations was naturally hailed with gratification by the Odontological Society; whilst to the College of Dentists it came rather as a surprise, since it had been thought that too strong a feeling existed in the medical profession to allow of the institution of examinations and the issue of diplomas in a specialty of any kind, either by the College of Surgeons or by any other body. The duty of those who had the direction of the affairs of the College of Dentists at once became clear. To have allowed the continued existence of the college on an independent basis after the battle had been thus fairly fought out, would have been unwarrantable under the circumstances. Instead of helping on a good cause, it could only have carried on an embarrassing opposition and postponed indefinitely the attainment of fraternal concord. The executive, therefore, understanding the importance of the crisis, placed themselves in communication with the council of the Odontological Society with the object of arranging an amalgamation. This was consummated with entire cordiality and good feeling on both sides, and he had no hesitation in saying it had never been regretted.

The course pursued was generally admitted to be the right one, and the twenty years which had elapsed had been pregnant with good results, the prominent one being the Dentists Act of 1878. Had the profession continued to be racked with widespread dissensions, that Act would not have been secured. As it was, the opposition to the measure arising from a small section of men with impracticable views was futile and, together with far weightier obstacles was, under splendid generalship, successfully overcome. This was unquestionably the most important event which had happened during the twenty years which had elapsed since the amalgamation. Its healthy action had already become apparent, but it would require time before all its latent powers for good could be fully developed, but its elevating influence would increase with each succeeding year.

In order to utilise the Act to the utmost, that invaluable organisation, the British Dental Association, had been established on a sound basis, prepared to deal with almost any question affecting the interests of the profession. Every thoughtful practitioner would do well to strengthen the Association by becoming a member, and he hoped that its already influential constituency would be materially augmented before the time came for holding the anniversary meeting in Liverpool, in August next.

The Dental hospitals are now indispensable; and of the schools and societies for the students, and of the standard to which literary fame is kept up, together with the progress of Dental journalism and the flourishing condition, not only of the Odontological Society itself, but also of the provincial societies subsequently established on the same lines, they might justly be proud.

As regards the work of the Society and of the profession at large, the former showed no signs of exhaustion. The papers have done much towards the illustrations of truth, and the published transactions, therefore, properly rank with the classics of Dental literature. Their range of knowledge has extended, and still yields fertility, showing that there is no boundary to the fields of scientific labour. Facts brought out in one inquiry would often suggest a variety of new ideas, each in itself capable of further development. It is by no means rare to find well-stored minds reluctant to give their opinions and impart their knowledge. Such may be a quality to be admired, but when carried too far, it becomes selfish.

With regard to the profession at large, the great work of the present age had been our steady progress in practical hygiene, by which human life was being gradually but surely elongated; and the Dental Profession could aid this by ascertaining more clearly the conditions which would favour longevity in the dental structures. Not long ago, at the Brighton Sanitary Congress, they were told that there was no valid reason why men should not live comfortably for a hundred years, and the census returns showed that a certain number did now reach that patriarchal age. Why was it otherwise with the vast majority? A satisfactory answer to this question would, probably, assist us in learning a great deal more than we at present know about local lesions.

Mr. Rymer, having alluded to the fact that after the 1st of November next no candidate will be eligible for election to the Society who does not possess a qualification, and that applications must be received by the Council by the 6th inst., said he could with confidence rely on the support of the members of the Society, following, as he did, the presidency of a brilliant and exceptionally successful year. He was conscious of the disadvantages under which he laboured, but with their kindly and sustaining influence he might, nevertheless, be enabled to follow the admirable example of his predecessor to an extent sufficient to maintain the dignity of the Society.

The Society then adjourned.

ODONTO-CHIRURGICAL SOCIETY.

THE Ordinary Monthly Meeting was held on the 9th of February, JOHN SMITH, Esq., M.D., F.R.C.S.Ed., President, in the chair.

Mr. WATSON showed a patient, a man between fifty and sixty years of age, whose nose, upper lip, and anterior portion of jaw as far back as the first pre-molar, with a wedge-shaped portion of the palate process extending as far back as the second molar, have been destroyed by lupus, otherwise called rodent ulcer. This disease is closely allied to the cancers, and expends its force in destroying every tissue attacked, but differs from true cancer in respect that its cells are less in size, and it does not spread by means of the lymphatics or by secondary growths. It usually begins on the face or head as a dry wart, which, after having frequently desquamated, begins to ulcerate, and slowly but regularly destroys all the tissues, soft and hard, producing, as in this case, a most disgusting and horrible deformity. The patient has been operated upon some six times for the removal of the disease, the last time by Dr. Chiene, about seven months ago, at the Infirmary. In October Dr. Chiene sent him to Mr. Watson, to see if he could do anything for him in the way of artificial substitutes for nose and jaw. After great difficulty he had succeeded in making up the jaw and palate by means of a hard vulcanite plate attached to the only three remaining teeth left in the mouth, and an artificial nose and lip, also of hard vulcanite, which is fixed to the plate by a special apparatus, the nose and lip being painted as near as possible to the colour of the face. The patient has been wearing them since December last, with great comfort and decided improvement in his personal appearance, enabling him to eat and speak comfortably, which was an impossibility before, as well as protecting the delicate mucous surfaces of the nasal cavity. The mouth cannot be opened except to a very small extent, owing to the contraction of a portion of skin which was brought down from the forehead to fill up part of the cheek destroyed by the disease, this flap of skin having been brought over the left eye, closing it up. This operation was performed by Professor Lister. The only way feasible to take a model of his mouth was to take it in two halves; but owing to the smallness of the space between the two jaws, even by this method it was impossible to get an accurate model.

Mr. BIGGS said this was one of those obscure cases which they rarely had an opportunity of inspecting; and, on that account, if no other, the Society was very deeply indebted to Mr. Watson for the privilege he had given them of examining his handiwork upon this patient. He could readily conceive the difficulty to be overcome in procuring an accurate impression, owing to the hard cicatricial margin of the orifice, and the difficulty of opening the mouth or depressing the lower jaw, consequent upon that. There was a great amount of ingenuity displayed in the construction and adaptation of the denture and the nose under these trying circumstances.

The CHAIRMAN thought the Society should express its obligations to Mr. Watson for the interesting case brought under its notice by him. The disfigurement and lamentable condition of a patient, such as he had shown to-night, as the victim, whether of lupus or rodent ulcer, was of an extremely sorrowful nature; and such an apparatus as the admirable one contrived by Mr. Watson was an unspeakable boon to the sufferer. So far as the material employed, and the construction of the apparatus itself was concerned, it must, in general, be determined by the special nature and condition of the case. In this instance, any defects in the colour or form of the new nose are of a comparatively trivial nature, and the main objects sought for had been gained.

THE Paper of the evening, on SURGERY TALK; or, CONVERSATIONS BETWEEN PATIENT AND OPERATOR, by JOHN LAWS, L.D.S.I., of Weymouth, was read by the Secretary.

The art of conversation, the oral interchange of thoughts and ideas between two or more persons, is one which should be fully cultivated by every practitioner of Dental Surgery. Few have such opportunities afforded them of indulging in it as he has; still fewer have the chances of imparting by its means instruction so needful, or that would be so much appreciated by its recipients. Daily compelled, frequently for hours at a stretch, to remain in the company of two or three persons, the operator will find that a pleasant, easy conversation on topics with which he is familiar, but to which his listeners are, probably, strangers, instead of hindering him, will help him with his work, by enabling him to forget the aching back and the much-strained muscles. Again, few people are brought into contact with such a great variety of temperaments and differences of character, all requiring different management, yet all necessitating a very large amount of tact and skill on the part of the operator, in order that he may not only perform the particular operation required by each, but, at the same time, impart to each, in a considerate yet conscientious manner, the praise or blame, advice or warning, which is quite as much due to his patient as is the performance of every operation to the fullest measure of his ability. And yet this is an art to which little attention or little thought is given. With by far the majority of our operators, the time spent with the patient in the surgery is exclusively devoted to the performance of the particular operation, and either no conversation at all, or political small talk or petty gossip, is permitted to engross the attention, and time is utterly lost which might have been most profitably spent in carefully and judiciously imparting to our patients the alphabet of Dental Pathology; and laying down for them, almost imperceptibly, yet in a manner which will strike home, rules, by the observation of which, caries may, in a large measure, be either prevented or modified in the future, not only in their own individual cases, but in those of generations yet to come.

Much aptitude, perseverance, and a well-studied observation of human nature, are required to commence and carry on such conversations as I have indicated. We all know that the address, or tone, or manner best suited to, and most likely to tell with, the patient who comes for half an hour's gratuitous service in the early morning, would be very *un*suited to the lady who engages our attention later in the day, and is accompanied by her friend or maid; yet both stand equally in need of advice and instruction, which are as much due to them as any other service we may perform. And if we allow "Mary Jane" to depart from our presence without earnestly giving her the warning or advice (which she may stand so much in need of), because she is a servant, and we have more important matters to think about; or, on the other hand, if we allow the lady to leave our room without having conscientiously given her whatever instruction we can impart to her for the future well-being of her dental organs, because we may fear it is a delicate matter on which to address her, and might give offence—then in neither case have we more than half performed our duty, or honestly fulfilled the charge committed to our trust as Dental Surgeons.

I was much struck, a short time ago, by reading a paragraph in one of our Dental journals, which it will not be out of place to reproduce here, as it well illustrates my meaning. Our American friend, in relating it, says:—

"A young man came to have his teeth cleansed and scaled. He seemed to have no idea of cleanliness, and had never used a toothbrush, toothpick, or even rinsed his mouth. I felt that if I performed the operation he required, of scaling and cleansing his teeth, I should be simply throwing away my time and his, and that eventually he would lose his teeth. I thought I could do him a better service by saying something he would never forget—that would shock him and arouse his pride. I said—'Young man, my friends all think I am a kind man, and I mean to be. Now, I have many patients who are very particular, who want my fingers to smell clean and sweet, and so I have to wash and scrub them after I handle a patient's mouth. I do not keep a cow, because I might be called upon to milk her; and if I did, it would take too long to get rid of the bad odour. If I cleansed your teeth, it would take too much of my time to get my hands in proper condition after it; and, although I am said to be a good-hearted man, I do not pretend to be any better than God Almighty, who is said to help those who help themselves. Let me see that you have some idea of cleanliness about your mouth, and if there is anything you can't do, come to me, and I will help you out."

"I did not know how deeply I had struck. The young man got up, and in a very modest way begged my pardon, and bowed himself out. I did not see him again for twenty-five years, when one day a man stepped up to me and said, 'Would you like to look at a set of teeth?' I said I should, if he had a set he wished to have looked at. Opening his mouth, the man said, 'Look in here.' I looked, and saw the most beautiful set of teeth I had ever seen—teeth perfect in form, not a discoloured one in the whole set, and the gums perfectly healthy. I said to him, 'My dear sir, I am *very* much obliged to you. I did not suppose there was a person in the world that had such a set of teeth as that. They are a credit to your dentist.' He said, 'I have not got any dentist.' 'Then,' said I, 'they are all the more credit to you.' He replied, 'You may well say that. I take credit for that job, and I feel proud of it. Look here! you don't think it would make your fingers stink to put them in that mouth, do you?' I said, 'Oh, no! What do you mean?' He asked, 'Don't you know me?' I said, 'I don't know that I ever saw you before.' He replied, 'I never shall forget you. I went into your office twenty-five years ago to get my teeth cleansed, and that is the way you met me.' And he repeated what I had said, recalling the facts to my memory."

Now, I have no desire to lay too much importance to a story of this kind, or set it forth as a model for us to copy in our ordinary daily conversations with our patients, for we must remember that the American, when speaking of number one and his achievements, is not unlike the Cockney from home when speaking of the marvellous wonders of the metropolis, or the Scotchman abroad when extolling the picturesque beauties of his native hills and dells—just a little apt to exaggerate. But the story, whether exaggerated or not, contains a moral, which moral it is my earnest wish should be the pith and essence of this paper, viz., that our work, however cleverly or scientifically performed, is only half done if we do not follow it up with earnest words to each of our patients in regard to that work, giving them the why and the wherefore of the necessity for the special operation performed, and explaining most fully what is their duty in regard to caring for and endeavouring to protect the work in the future; for I think you will agree with me in saying that the result as to permanence of a large proportion of our operations depends nearly as much upon the patient as the operator. No matter how good a filling may be, or how cleverly and perfectly it has been inserted, the chances are that the time, and thought, and care, and labour, and money that have been expended upon it will be utterly thrown away unless we have taken the pains to teach our patient to take care of it.

I will now select a few of the patients and cases one is most likely to meet with in any ordinary day's work. Say we commence our duties at 9.30 a.m., and reserve till 10 o'clock for gratuitous cases. We find awaiting us a boy, age about fifteen, with a raging toothache, imploring us to take his tooth out. On examining his mouth, we find that extraction will be the kindest and most efficient service we can perform for him. It is done, and he is made happy; but before we let him go, we strongly urge him to return very shortly, to have the fellow tooth on the other side of his mouth likewise extracted, as it is in a very bad condition; and noticing that his mouth has all the appearance of being totally innocent of tooth-brushes or tooth-powders, we plainly tell him that poverty is no excuse for uncleanness, that we shall be very happy to perform any operation for him that his teeth may require in the future, but only on condition that he presents to us a clean mouth; finishing up by letting him know in pretty plain language that he is damaging not only his teeth but his constitution and future health by indulging in the use of tobacco at so early an age. He leaves our room and goes his way, perhaps to follow up our advice and possibly return, perhaps not; but, whichever way it is, we have the consolation of knowing that we did not let an opportunity slip, but strove to use to the best advantage the chance which providence had thrown in our way of speaking earnestly, and thereby influencing for good a thoughtless lad.

But another patient awaits us—this time a Miss of probably twenty summers or thereabout—who, though adorned with feathers and trimmings and gloves, such as many a well-to-do tradesman's wife might envy, is yet not ashamed to give us an early call for gratuitous advice, and perchance services: a shop girl, of course, whose brains may be said to be as small as the extent and extravagance of her wardrobe is absurd and unnecessary for her station. On examining her mouth, a sad state of affairs is revealed; decay, deep-seated and extensive, has taken hold of a large proportion of her teeth, some already past salvation, others not so. We at once commence a conversation by asking why she had neglected them so long. She replies that she had not noticed they were so bad, till a sharp twinge the previous day had made her examine her mouth; then, fearing the tortures of toothache, she came to ask our advice, hoping the cost of putting them in order would not be great, as she could not afford to spend much on her teeth, and, indeed, rather than that, would let them all go, and then have new ones. How she could reconcile the sealskin jacket, the feathers, and the gloves with her inability to spend a little on her teeth for her health's sake, we, who are not initiated into such mysteries, know not; but our duty was clear, and our conversation must plainly show her the folly under which she is labouring. Hence we commence by telling her that to put her mouth in order would necessitate something like a week's work, which, of course, she could not expect to have done for nothing, that it would be wiser to spend something in saving her natural teeth than in waiting until she required artificial substitutes, which are all very well in their way, but much more expensive and not quite so reliable, and that she must reconcile herself to the fact that the teeth which Providence bestowed upon her are of some value, and worthy a little attention and expense. She also goes her way, perchance a little humbled, but still with a little honest truth to ponder over, which may possibly lead to wise resolutions and good results.

We now turn our attention to our appointments for the day. Amongst them we have a young lady, accompanied by her mother. We have arranged to insert for her this morning a gold filling, and anticipate about two hours' work. Here is at once presented a fine opportunity for profitably whiling away the weary waiting of the parent, diverting the attention of the patient, and imparting to both facts and information, which will interest and prove of service to them. Hence, after examining the tooth to be filled, asking a few questions, and making a few remarks upon it, we select our rubber-dam, &c., and whilst so doing explain the object in using it and the necessity for it. Having thus, at the beginning, taken both parent and patient into our confidence, our way to continued and easy conversation is not difficult; at each stage of our operation, we offer observations concerning what we are doing, not forgetting to mention a little about the anatomy of a tooth, from what sources it derives its life, of how many parts it is composed, of what each part is composed, what changes take place if its pulp is destroyed, and what results it might lead to, why we fill this tooth with gold and another with amalgam, what are the probable causes which have led to this tooth's decaying, &c., until we find that the two hours have slipped away pleasantly and profitably, our filling is completed, and we finish up by eventually impressing upon the patient what means she must adopt, and what rules must be rigidly adhered to, even now the tooth is filled, if she desires to keep it and save it from further decay.

In the course of the day a retired Colonel comes in by appointment to have his teeth scaled. He is a tall, heavy, broad-chested, mighty man of valour, with a set of teeth almost equal to grinding cast iron. According to our habit, we at once commence a conversation, and compliment him on the possession of such a rare prize. He values his teeth, has always valued them, and hopes to carry them intact to his grave, by taking all possible care of them. Shortly he puts the question—"How is it that people's teeth now-a-days are so bad that it is quite the exception to find a person in the possession of all their teeth?" Now is our opportunity; 'tis the very query we wanted—what, indeed, we had been working for. This gallant officer is a father, with many sons and daughters growing up, all with teeth much inferior to his own, and which have been under our care for some time. Now is our chance, for we can speak upon matters which are far too delicate in nature for us to broach in our intercourse with ladies, but which we know, through him, will find their way home to such; so we set to work in right good earnest, not only to scale his teeth, but to have a thoroughly good conversational talk with him. We begin by telling him of the importance of the subject he has unconsciously entered upon, and how it is almost inexhaustible. We then tell him a little about the genesis of the human teeth, remarking how their formation commences about the tenth week of fœtal life, and how, at birth, many of the teeth are already formed and calcified; then we draw his attention to the manner of life and living at present pursued by our mothers and expectant mothers—how, in place of taking a genuine pride in the fact that they are about to become the mothers of untold generations, and thereby have the fate and happiness or well-being (as far as health is concerned) of those generations in their keeping, it has come to be considered the proper thing to distort the figure and hide pregnancy as far as possible; to make no alteration during two-thirds of the pregnant period in the mode of life, so far as indulgence in pleasures and social frivolities is concerned; in fact, to consider it a burden, and almost a shame, to be called upon to occupy what God has ordained as the highest position a woman can fill upon earth. And, further, when at length the poor infant is born, and is eager and ready to receive and be nourished upon what only a mother can properly supply it with, we find that, instead of every mother feeding naturally her own offspring, perhaps only one in three has the courage to do so. A century ago, a woman who neglected wilfully such a duty would have been scorned by her sex; now the woman who undertakes it is looked upon as a self-made martyr. To the winds with your cow's milk, or your ass's milk, or your goat's milk. Analyse it as you will, there is no food fit for an infant but its mother's milk; nor can either its body, brain, or teeth be so fully and perfectly nourished on any substitute, and it will be a glorious day for Great Britain when it shall be made a *sine qua non* that before entering upon marriage the woman shall undertake to suckle her offspring.

Following upon this, we enter into a conversation upon our food, especially speaking in strong terms of the value of the phosphates, and showing how carefully and wonderfully at the present day every means are taken to eliminate almost all trace of them from our daily diet. We continue by laying stress upon the necessity of using prophylactic measures, and paying due attention to the general hygiene of the mouth, &c. We find we have only got warmed to our subject when another patient is announced. The hour we had reserved for the Colonel is gone, and we are obliged to dismiss him, making an appointment for a future day, to finish our work and resume our conversation. He comes accordingly, and, whilst carefully and efficiently paying all due attention to the execution of the primary object of his visit, we resume our conversation, taking up points we had not time to touch upon before, and in full, giving him such a lesson in Dental Pathology, that he tells us with gratitude he is not likely to forget it —that he now sees clearly a cause for our present bad teeth, or dental degeneracy, which must of necessity eventually lead to our national degeneracy, and that he shall use his influence, in his own family and outside, to stem the awful tide which is working such dire destruction.

I have chosen these few examples, not so much as models to be copied, as types of how easily our conversations may be commenced, our thoughts set to work with, or independently of, our fingers, our patients interested and instructed, and the cause of humanity benefited. If we fully realise the responsibility laid upon us as Dental Surgeons, we will not be slow to recognise the benefits that must result from judicious conversations with our numerous patients. If every Dental Surgeon in our land would resolve, even if only one day a week, to sow in the mind of every patient that visited him on that day, one seed out of his granary of knowledge concerning the *causes* of the present prevalence of Dental Disease, eventually a plant would grow up of which we might be proud, and the terrible wave of destruction now so rife, if not stemmed, might at least be checked. We pay too much attention to remedial measures, and too little to preventive ones; our very best means of drawing attention to the latter is by our "Surgery Talk;" it is a most powerful lever which has been placed in our hands; it will influence the Father and the Mother, it will influence the young Man and the Maiden, it will influence the Children yet unborn. To over-estimate its importance is impossible. In olden times it was considered almost a disgrace for a woman to be barren or fruitless; now the childless woman is almost envied, and the inconveniences and expenses attendant upon child-bearing are looked upon by many as burdens. Let us endeavour, then, by our conversations, to show up this matter in its true light, and strive to bring about a better and more natural—hence more healthful—state of things; for as the power of speech, that Divine gift, which an all-wise Creator has bestowed solely upon mankind, raises him immeasurably above any other living animal, the responsibility devolves upon us of taking every opportunity of using it for the advantage and well being of our fellow men ; and, as Dental Surgeons, opportunities are thrown in our way which few possess, of educating our race to the necessity of paying strict attention to the natural laws of health, enforcing specially upon their minds that portion of the subject which belongs more particularly to us, and, to my mind, is as important as any other, for I have little hesitation in saying that the deterioration of our teeth at the present rate means eventually the degeneracy of our race. Let every Dentist, then, not consider himself proficient in his calling, or equal to the efficient performance of his duty to his patients, until he shall have studied and mastered this art of conversation, so that the drift of our "Surgery Talk" shall be to elevate the minds of our fellow creatures, and not only enable them to appreciate our work, and strive to take proper care of it, but to endeavour in their families, by due attention to the simple laws of Hygiene, to bring about a state of things through which their offspring shall at least not be worse off in their dental organisation than they are.

By thus cultivating and earnestly using to the utmost of our ability, the conversational powers with which God has blessed us, we shall, indeed, benefit our race ; for if Britain is to retain her supremacy among the nations, her sires must retain their teeth.

The CHAIRMAN, at the conclusion of the reading, said he felt sure the Society was much indebted to Mr. Laws for his communication, just read by Mr. Macleod. In a Society like this, where the papers are, as a general rule, of a strictly scientific or practical nature, it was refreshing, and a pleasant and welcome diversity, to hear a contribution such as that of to-night. Perhaps in no way could a speaker more effectually command the attention of his hearers, than by assuming them to be placed in the circumstances he may be describing. He in this manner appeals to their feelings, and commands their sympathy, with all the force of the *argumentum ad hominem.* Their minds became, as it were, *en rapport* with his—they enter into the difficulties pourtrayed by him—consider the remedies he suggests, and actually feel relieved if these seem to meet the requirements of the case. Now, this is very much the mode adopted by Mr. Laws in conveying the information afforded in his paper, and if beneficial ends can be achieved in an occult and hidden manner, and lessons carried home to the listeners insensibly to themselves, while they have been entertained by an interesting and agreeable discourse, they will have been afforded a combination of business and pleasure, amusement and instruction, of a very valuable and acceptable kind. Perhaps, on reconsideration, Mr. Laws might be inclined to modify his views on some more purely medical subjects introduced into the paper. There is always a danger of getting into difficulties in merging the dental into the medical practitioner, and the question of nursing and its results, not merely on the teeth, but on much more important organs, might, he thought, be safely left in the hands of medical men. The paper of Mr. Laws merited the thanks of the Society.

Mr. BIGGS said—There can be little doubt that a vast number of our patients injure their teeth and health through ignorance; and that the education of patients on such subjects must, in the meantime, to a great extent, devolve upon the dentist. The discussion having been closed,

Mr. WATSON said—I have here two interesting specimens of replanted teeth. No. 1 was replanted February, 1874, in the mouth of a boy aged seven years at that time. The patient was attacked by measles a few days after the operation, and yet the tooth did very well, and was quite firm in little more than a month. I extracted the tooth last September, more to see what condition it was in than anything else, as the tooth was comparatively firm, and might have lasted two or three years longer. It had thus been replanted about seven years. Upon making a microscopic examination of the tooth, I discovered numerous excavations (*lacunæ of Howship*) produced by the multiform oteoclast cells derived from degeneration of the cellular elements of periosteum. Of the other cases shown along with this one in 1874, some have failed, and others have been lost sight of through the patients removing to other parts of the country. No. 2 was replanted May, 1880, and had got so loose last September, that the boy pulled it out himself with his fingers. The dentine and cementum of the roots, in this case also, have numerous excavations on them caused by the absorption cells. The experience I have had of replantation leads me to think that this operation will only be useful in exceptional cases, as the roots of the tooth are sure to be destroyed sooner or later by the destructive action of the osteoclast cells. I have only tried one case of tortion, that of an upper lateral incisor, which, when I was busy twisting, the boy took hold of my hand and pulled out. I just reinserted it at once to see if the nerves and vessels would unite again, as I have seen asserted they do. In the course of a few weeks a large abscess appeared over it, showing that in this case, at all events, they had not done so.

The CHAIRMAN remarked that the subject of replantation or transplantation of teeth was one beset with many difficulties in determining its value as a surgical operation. It had been revived from time to time for the last hundred years, but had never seemed to maintain its ground as a reliable mode of treatment. Cases might appear successful for months after its performance, but, within a few years, the majority of such cases turned out to be unsatisfactory. He admitted that perfect success was in some instances attained. But from his own experience—and he had devoted some attention to the subject between twenty and thirty years ago, as well as much later—he had not much confidence in it. At one time he tried the lifting of teeth from their socket, and replacing them, without their absolute removal, once advocated as a cure for toothache. He had also rotated the incisors in their sockets for irregularity in position; but he now would have much hesitation in adopting either modes of practice. The absorbed appearance of the fangs in the teeth shown by Mr. Watson, was interesting, and was no doubt due to the same cause as atrophy of muscles and other tissues following division of a nerve, as in many cases nerves never unite again after being divided, and lead to a number of curious effects upon the nutrition of parts supplied by them, as in division of the ulnar nerve in some cases, division of the fifth pair, and in other examples well known in pathological literature.

Mr. MACLEOD said that, personally, he was much indebted to Mr. Watson for bringing these cases before the meeting, as they were a confirmation of the opinion expressed by himself when Mr. Watson previously exhibited these other cases in the mouth as successful results of replantation. At that time Mr. Watson was not inclined to entertain the idea of the possibility of failure, as the operations had been conducted with care, under strict antiseptic surroundings. But now, finding his then convictions overturned by facts which could be seen and handled, he brought his failures before his fellow associates, and honestly avowed his conversion. The opinions which he (Mr. M.) then held, and which were based upon personal experience and experimentation, and recorded in their Transactions, were—1st, That replantation of a tooth which had been the subject of alveolar abscess was never permanent; 2nd, that even where successful for a few years, the game was not worth the candle; and 3rd, that although replantation might occasionally be indulged in as a temporary expedient, it would never take its place as a recognised operation in dental surgery. Cases which had been published between that date (1874) and this only tended to strengthen these opinions, and as these recorded cases had been operations by men of undoubted knowledge and skill, no room was left to gainsay the unsatisfactory nature of replantation.

The CHAIRMAN then intimated that the Annual Meeting would be held on March 13th, at 2 P.M., when an interesting paper on "Dentition in the Horse and other Animals" would be read by Principal Williams, F.R.S.E., of Edinburgh New Veterinary College.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

THE EXPANSION PLATE.

To the Editor of the DENTAL RECORD.

SIR,—Your correspondent, Mr. Headridge, L.D.S.I., who is to be congratulated on being able to claim in these days an "invention in its entirety" as "wholly and absolutely his"—reiterates on p. 91, with somewhat unnecessary warmth, statements I have repeatedly answered elsewhere. ("British Journal of Dental Science," Jan. 2, p. 47, and Jan. 16, p. 101.)

Briefly, however, the facts are, that my father in common with others used "expansion plates" before Mr. Headridge entered the Profession; that gentleman, however, (for many years my father's assistant) about 1868, suggesting the employment of tempered steel springs in connection with them. This idea, quite independently, my father soon further developed, and with the help of piano wire and modifications of construction turned to so good account and showed to be of such value, that in 1869 Mr. Headridge took out Royal Letters Patent for "Improvements in Dentistry for expanding the upper and lower maxillary," claiming only, and broadly, the "forming the plate in sections, and using springs to expand them," as "new and never before used." (?) The specification, No. 1101 (obtainable for 6d.) only vaguely defines the proposed plate, of which no further account has ever been given by the patentee to the Profession or to me. It is, of course possible that Mr. Headridge may have since worked out his original plate to a really practical form. But if so, others have been denied the benefit of it. If Mr. Headridge, however, had been present at the Congress, or had been well informed of its proceedings, he would know that in addition to rescuing his name from oblivion and giving him due credit in my paper, I fully described his plate to the Section, laying before the members his own drawings of it, and distributing copies among them; and in demonstrating some 400 different specimens of actually used and practical expansion plates, I pointed out carefully the essential difference between them and the "Peter Headridge Plate." Even if the device I advocated were not a totally distinct thing, Mr. Headridge, who states that he took out his "Patent" only to "prevent" Dr. Coffin "from claiming the originating of the said plate" ("British Journal of Dental Sceince," Feb. 15, p. 206)which my father never did—can hardly now affect to be "stupified" that the Profession who are indebted to him for nothing, refer as "Dr. Coffin's plate" to that which so long and widely has been associated with my father's name. Furthermore, in reference to some entirely irrelevant but inaccurate statements of his, I beg to point out to Mr. Headridge that I certainly did *not*, as he says, "unblushingly claim the invention of the expansion plate" for my father (I leave that to Mr. H.); and that I have *not* (as I might) even *once*, "throughout my paper spoken of Dr. Coffin's expansion plate," as he also alleges: and that I may not be misunderstood I wish to repeat that while my father is too sensible of his indebtedness to others to even speak of "his expansion plate," yet the plate so well known as such, is (with the sole exception of the idea of steel springs) perfectly independent of Mr. Headridge. Unless Mr. Headridge has some further grievance which does not appear, I feel that the strong expressions he makes use of, must be due to an entire misconception of the facts.

Yours, &c.,

94, Cornwall Gardens, London, S.W.
Feb. 10, 1882.

WALTER H. COFFIN.

GROSS MALPRACTICE.

To the Editor of the DENTAL RECORD.

SIR,—At the present time, when the members of our Profession are everywhere congratulating themselves and, as it were, patting each other on the back, at the position which we as a body are taking in society, we should not forget that there are those in our ranks, legally authorised to practice Dentistry, who daily give us the lie direct in the eyes of the public. I speak now not only of those downright incompetent men who have crept into our midst by a back door, at the passing of the Act, but of men who, knowing better from having had a proper training at their profession, are capable, for the sake of a few shillings, of lowering their own dignity as men, and the Profession as a whole, by the most criminal humbug and malpractice.

It must be an everyday experience for the readers of the Record to have patients presenting themselves suffering from the incompetence of men calling themselves Dentists. In this case we pity the patient, and in our own minds condemn the Dentist as a quack.

But when we see a case such as presented itself to my notice a few days ago, we blush for the name of Dentist, and desire some method of punishing the offender.

A lady sent her maid to us for our opinion about a stump which was causing great suffering. On questioning, I elicited that she had been to another Dentist about it, and he had said, would you not be pleased if I could save you the suffering of an extraction? On getting an answer in the affirmative he "put something into it," charging the girl for so doing. I examined the root, which was completely overlapped by a very swollen and inflamed gum. To my astonishment I saw something metallic peeping out. On probing I found this metallic something was moveable, and of course lifted it out, It proved to be a piece of amalgam. The Dentist had been stopping some other teeth, and had evidently, so as not to waste a spare bit of material, made a job by pushing it into the hole in the gum. On extracting the stump I found a large abscess sac at the apex.

What name, I ask, properly describes the man who could do such a thing? —Blackguard. What would be the best course to pursue in such a case?—Get the patient to prosecute, and go into court as witness; or must so-called professional etiquette tie our tongues, while poor suffering humanity falls a prey to such sharpers. The man who did this, proved his competence as a Dentist, in the stoppings which he had inserted in the other teeth. "To what base use may we descend."

Let us not talk too boastfully of our newly acquired status in society, till such blots as these are wiped off the pages of the register.

Yours &c.,
FREDERIC ROSE, L.D.S.Eng.

To the Editor of the Dental Record.

Sir,—I notice in your answers to correspondents in the February number of the Record, that you advise a correspondent to inform the British Dental Association of the existence of a Mr. Howard Lindsay, Dentist and Herbalist. I presume Mr. Howard Lindsay is not registered under the Dentists Act, or if so that he has broken the Act in some way. If my presumption is right, then I think your advice wrong, for I am not aware that the British Dental Association has taken any action in such cases; moreover the British Dental Association says that the Profession does not support it sufficiently to enable it to grapple with such lawless practitioners. It may be purely a matter of opinion that they do carry out "the maintenance of the spirit and provisions of the Dentists Act by such lawful means as may be necessary," &c., &c., or that the Profession might support the Association more than it does. It may be that the British Dental Association is mindful of the weaknesses of the Act, and won't waste its funds, but will kindly advise some private persons to be made the catspaws. To all thoughtful men it must be a question of doubt if the late Act has given cause for the rejoicings that have been made in some quarters; and if we have not added to our ranks a large disreputable body that never would have been added but for the agitations preceding the passing of the Act. We are told that for a present disadvantage we shall reap a future reward. Let us examine the harvest as far as our present lights exist. Will the next generation be purged of the impurities ?—not at all, for as many men, disreputable or not, as like may carry on the practice of Dentistry without conforming with the Act in any way, "provided" as the lawyers say, they do not use the word "Dentist." The following will serve as an example :—

In a village about 20 miles from the Metropolis lives a man who keeps a beerhouse of the lowest type, the rental I should think would be about £12 per year. On a wire blind in the window of what I suppose is the parlour is recorded the following :—

"William Halley. Teeth carefully extracted at moderate charges. Excellent tooth powder." Some of the teeth which have been so carefully extracted are placed in wide necked bottles, which, with some plaster models, complete the ornamentation of the said window. I must say he carries out his promise as regards his moderate charges, his fee being 6d. for extraction, and I believe the same for "stopping;" and let us hope he as faithfully carries out the "carefully extracted" promise. But that I cannot personally attest. I cannot find this man's name on the register; but I understand that as he does not use the word "Dentist," he can go on rejoicing without let or hindrance from all the authorities in Christendom. (*vide* answer to a member in the "Journal of the British Dental Association.") Verily the subtleties of the law are great; for if the extraction or otherwise attending to the teeth, and replacing them artificially does not constitute the practice of a Dentist, I am at a loss to know from whence he gets his title.

I am, yours truly,
CUI BONO.

Editorial.

THE MILLSTONES OF THE PROFESSION.

Much has from time to time been said about advertising. To attract attention by the usual show-case, by announcement in the public papers, or by circular, is unprofessional. The bye-laws of the several professional societies preclude such practitioners from membership, and certainly tend to raise and maintain the dignity of our calling. There have been adopted various means, which are too well known to need mention, in order to be "reviewed," and to obtain a favourable "opinion of the press" upon an elaborate dental establishment and the ingenious appliances to be found therein. We are constantly receiving circulars and newspaper advertisements from different parts of the country, showing that advertising is still resorted to even by diplomaed men. Much as this condition of things is to be deplored, we, in common with all other journals, are prevented by law from signalling out individual cases. There is, however, a way, though not overlooked, has not yet been adopted, by which the Profession may be made aware of the unprofessional conduct of some of its members. And we think it might not be an unfitting task for the representative Association to reprint any such circulars or advertisements as may come to its hands, and distribute them to the members.

But is ethical obliquity the greatest detractor from which the honour of our profession suffers? Incompetence and dishonesty are rife, and while diligence is bestowed upon the garnish of the outside of the cup and of the platter let not the inner actions of men be forgotten or neglected. Occurrences allied to the case mentioned by one of our correspondents, are too common; and hope for the eventual elimination of rascality has its most sure foundation on compulsory education. Objections have been made to the admittance to the Dental Hospitals of patients who have been able to pay small fees, to the deprivation of a certain class of practitioners of much of their *clientèle*. The staff of those institutions have frequent opportunities of seeing some such patients who have been attended to by members of that class. The work is almost invariably of the crudest kind, and done without any attempt at proper treatment—metal fillings upon exposed pulps; the fillings in approximal cavities united; no preparation of cavities; yet, "something" done to get a fee. When poor people are imposed upon in this manner by the incompetent and dishonest, the Dental Hospitals do a great service in relieving those who, though able to pay a small fee for reliable work, cannot afford half a guinea, or even five shillings, as remuneration for services rendered. When the practitioners who suffer by this work of the Hospitals show that they are competent to do what they profess to do, and perform their work in a proper manner, then, and then only, will they have just cause to complain; and there will be little doubt that the charitable institutions will aid them in their daily calling, and minister to the necessitous poor only.

Incompetence, dishonesty, and vulgar advertising are the chief millstones round the neck of the Dental Profession. Though other professions are not free from similar disreputable practices, yet that fact is no justification for the existence of the evils within our body, evils which are ever to be discouraged, and the more noble course of procedure indicated and extolled.

ANNOTATIONS.

At a meeting, on the 9th ult., of the Branch Council for England of the General Medical Council, permission was given to a certain private Dental practitioner to institute proceedings against two persons for describing themselves as Surgeons and Dentists, and practising in that capacity, their names not being registered in the *Dentists' Register*. This will be, we believe, the first prosecution of the kind under the Dentists Act; and by it the vigilance of the representative association of the profession will be exceeded by individual aggression.

We are for want of space compelled to withhold from this number some Correspondence, Gossip, &c.

THE

DENTAL RECORD.

Vol. II. APRIL 1, 1882. No. 4.

CELLULOID.

By Harry Rose, L.D.S.Eng.

Lecturer on Dental Mechanics at the National Dental College, Dental Surgeon to the National Dental and Metropolitan Free Hospitals.

(Concluded from page 100.)

In the case of a plain upper or lower model I mentioned that it should be placed in the lower or bottom part of the flask; but if a model have natural teeth standing, or have artificial teeth fitted on the natural gum, then it should be placed on the upper part of the flask. When the teeth fit on the natural gum the model should be sunk pretty deeply in the upper part of the flask, in order to allow of the plaster investment being sloped from the edge of the flask down to, and just covering the points of the teeth, so as to hold them firmly in position, and prevent the celluloid from getting between them and the model.

Where the teeth, or any of them, do not fit on the gum, the plaster should be brought in a line from the edge of the flask to the necks of the artificial teeth, and should be sloped upwards to the points of any natural teeth, in order to strengthen them. Thus, if there are three incisors fitted on the gum, and four molars not on the gum, the four molars would come away in the bottom part of the flask, leaving in the upper part the wax and incisors, the teeth being held in position, as before described, by plaster or any small cramp made for the purpose. The plaster of Paris used for both models and investment should be of the best quality, and should become hard and dense when set; and the plaster model that the work is to be cellulized upon should have been cast some hours or even longer before being used. There is a very strong tendency to thickening of the palate, and it can only be accounted for by the fact that recently cast plaster yields somewhat considerably under pressure. That this must be the case is, I think, proved by the thorough closing of the flask, that the teeth are not raised, and that a model which has been cast some hours is not injured at all in the process. To overcome this thickening of the palate it is necessary, therefore, to allow the plaster some hours to thoroughly harden.

Too much cleanliness cannot be observed whilst working celluloid, as the smallest spec of dirt, or discoloration comes into bold relief when the case is polished. The celluloid boiler should contain about half a pint of water, and be well washed out before using, to ensure its being properly clean. The wax which is used should be as free as possible from pigment; I use white wax just tinged with carmine.

Celluloid, being such a near approach in colour to the natural gum, well repays the artist for any trouble he may take in manipulating it, in order to reproduce as near as possible the contour, rugæ, and form of the lost natural organs. If it is made thin and the rugæ brought out, it is astonishing how beautifully it blends with the natural gum, so much so, that one may look into the mouth of a patient and yet be almost unaware of the presence of the artificial piece.

Prior to the invention of the steam swager, I used to obtain a metal cast, stamp up a piece of meter metal, and use this instead of wax to mount my teeth upon. This piece of metal, of course, represented the thickness I desired the celluloid plate to be. After the teeth were mounted and the wax brought neatly round their lingual surface, I made a second model of the case in metal, and stamped up another piece of meter metal to come up to the edges of the teeth, to represent a polishing plate, as the colour and beauty of celluloid is best preserved by cooking it between two metallic surfaces. This polishing plate should be burnished on the surface next the matrix plate.

In choosing the base for a case, it is as well to bear in mind that a thick small one is better to use than a wide one; the latter is very apt to buckle when the metal model is forced into or through it, and a mark, as if the piece was cracked, is the result.

When clasps are to be inserted, it is best to make the fastenings to spring upwards from the gum, so that the pressure does not force them out of position.

The articulation should always be upon teeth or metal, and not on the base, as, although much stronger than vulcanite, it is not so hard, and is apt to wear away in mastication.

When it is desired to make a combination of gold and celluloid, it is as well to solder a piece of gold wire around the labial border of the plate to form a ledge, as it were, for the celluloid to rest upon. After which, mould up some wax or composition on the plate to represent rather more than the amount of celluloid required, then remove the wax—or we will call it dummy—from the plate and insert it in plaster in a celluloid flask, having the base of the dummy in the lower part, and the other portion in the upper part. Then take a suitable base, saw it somewhat into shape, remove the wax dummy from the flask, and introduce the base into the vacancy to be forced into the proper shape.

The fastenings to hold the celluloid are now soldered to the gold plate, and the teeth mounted on it; after which it is placed in the flask, as previously described, and the plaster brought over those portions of the plate that are not required to be covered with celluloid. This holds it firmly in place, and does not allow of its rising. The outlet for the surplus material is now made, and the flask brought together. This kind of work has a very beautiful and rich appearance, and is a great improvement over the continuous gum work, both in lightness and strength, with the further advantage that it does not take a tenth part of the time to make.

In adding a tooth to a celluloid case, or replacing one which has been broken off, it is necessary to have a clean cut or filed surface, free from any foreign substance. The tooth to be added may now be fitted, and fixed in position by means of wax, and the case should then be placed in the flask (upper part), leaving only the portion that has the addition exposed. The wax is thoroughly removed, the surface and margins of the cavity scraped, and a piece of celluloid, slightly larger than wanted, is fitted into the interval.

The two surfaces are now made to adhere by lubricating them with spirits of camphor, or a solution of celluloid in spirits of camphor, the two halves of the flask are then quickly put together and screwed home in the boiler. If the addition has been neatly done the join ought to be almost imperceptible.

Great care is necessary in sinking the case in the flask to avoid bubbles in the plaster, for as the mass (not like vulcanite) becomes plastic, pressure applied at one side is sufficient to force the celluloid into any cavity there may be, even at a distant part of the work. The boiler should be kept hot, so that the added piece may be forced rapidly into position before the spirits of camphor have time to evaporate.

It is very much like bone to finish off. Use fine sandpaper or glasscloth to get a surface, then a rub with pumice, and polish with whiting: the work should be kept wet and the brush lightly passed over it to prevent heating, and so warping the case.

A great many dentists have asked me, do I find celluloid warp? I do not; and I attribute my success with it to the fact that in nearly every case a dummy piece is made first of all, and if there is any warping it would most likely take place in that, which would have somewhat of an inclination to return to its original shape; the further pressing down and heating of the dummy, which is already a pretty good fit, must assuredly confirm and maintain it in its new shape.

During my experiments with celluloid between two and three years ago, I certainly thought that we had at last obtained a material that answered our expectations in every particular. It came into the field with many flattering testimonials from our American brethren. and certainly had the appearance of being the long sought for substance that was to imitate the natural gum and serve as a basis for artificial teeth. But, time, the great prover or disprover of the value and utility of every invention, has at last placed celluloid in its proper position in the Dental laboratory.

Its chief faults are loss of colour, after twelve or eighteen months' wear; and its inability to resist the action of the secretions of the oral cavity for any great length of time. In some mouths it may and does last much longer, but such cases are those in which the patient exercises a great amount of attention in keeping the work extremely clean.

I should only advise its use, therefore, in plain upper and lower sets, temporary cases, and regulation plates; for the latter it is admirably adapted.

Notwithstanding its unstable character, it is undeniably the most beautiful, and most natural looking, of any substance that has hitherto formed the basis of artificial teeth. Given, that it is steamed between two metallic plates, and the true colour and dense surface thus obtained, it presents when finished a perfect work of art; and, whilst repaying the dentist for his skill and trouble, it perfectly captivates the patient by its appearance.

NITROUS OXIDE AS A LOCAL ANÆSTHETIC.

By Stephen Hoole, L.D.S.Eng.

Mr. Wallis, in the March number of the Dental Record, thinks the above might be made available in minor operations of surgery by external application. I apprehend that it matters little what agent we employ to bring about local anæsthesia by the benumbing process, whether it be Nitrous Oxide, or the old frigorific mixtures of ice and salt. The application of the latter was commenced in 1848 by Dr. J. Arnott, and two years later M. Velpean performed the operation of opening a large abscess, with freedom from pain; and he afterwards removed the toe-nail in six cases under the same painless condition. Mr. Thomas Nunn, in 1850, removed some warty excrescences by the same means, and with very slight suffering and little hemorrhage. About the same date Sir James Paget excised a large fatty tumour from the shoulder of a lady, and made an incision about 4 inches long to dissect it out, yet we are told no pain was complained of. He also employed local congelation in twelve other cases with the same results. But, notwithstanding these successes, the method was allowed to lapse until a long time after, when Dr. Thomas Wood, of Cincinnati, tried cold for preventing pain in surgical operations with some success; but he mentions cases in which the operations failed. The question is, why did the eminent men not follow up the experiments? Was it from the after-effects of sloughing, or the devitalising the parts? We must bear in mind that parts exposed to cold become more or less impaired, and we know too well the sufferings endured by the men of our Arctic expeditions—in the latter cases, of course, the effects were the results of continuous cold. Now the question is how far we could carry the influence of Nitrous Oxide to produce sufficiently the insensibility required without after bad effects on external parts. I have never tried N_2O locally on dry surfaces, for on those alone would it be available; for we know by the experiments of the ether spray that it does little good in the mouth in consequence of the saliva, the only successful cases being the upper incisors. In 1856 I had twelve months' experience with Mr. Walter Blundell and his patented apparatus for extracting teeth by congelation. The frigorific mixture used being the two parts ice to one of common salt. This was placed in a tub outside the surgery wall at an elevation of 5 feet, and allowed to flow through a gutta-percha tube to the apparatus, which had a ball thermometer attached to it. Water at 60 degs. was first allowed to flow through a membrane controlled by cap gauze, and through one handle of a pair of gutta-percha forceps, which were placed over the offending tooth or two teeth, which it might be made to encircle, the waste water being carried away through the other handle into a waste pipe. The result was quick congealing of the surrounding parts of the teeth, and when the teeth were extracted the whole tissues were blanched to the bottom of the sockets. The heat caused by the returning blood had to be mitigated by applying the bag or iced water to rinse out the mouth, the patients often exclaiming that the remedy was worse than the evil. Seldom did our patients favour us with a second visit, unless it was to complain of the non-healing of the gums; and I have anything but a pleasant recollection of the unfortunate cases of sloughing followed by sinuses through the cheeks. Therefore, I should advise great caution in trying the freezing action of liquid Nitrous Oxide, where a deep-seated operation is to be done, however minor it may appear on its surface; but not to try it in the mouth, unless it is the wish of some one to reduce his practice and, in the end, find his occupation, like Othello's, gone.

OPERATIVE DENTAL SURGERY,

Being part of a Course of Lectures delivered at the National Dental College, London,

By W. Finley Thompson, M.D., D.D.S.

Operative Dentistry, like Surgery, has its separate relations, on the one hand to pure thought and deduction, and, on the other, to mechanics, by which latter I mean the dealing with bodies and forces, whether they be the teeth or the application of instruments.

Dentistry, however, cannot be contemplated as an abstract study, although the time may come when we shall have consulting Dentists as we now have consulting Surgeons.

Of æsthetic dentistry it must be admitted that theory is effective commensurate only as it is blended in an intimate relationship with practice; and, in support of this opinion, I shall conform to the indications that I believe justify me in making the assertion.

Having in previous lectures reviewed the different forms under which disease may manifest itself in the teeth, your attention is now directed to the preparation of cavities, and the introduction of gold into cavities.

I call attention to these two sections of the subject, with the object of investigating their direct bearing upon Operative Dentistry as a whole, in connection with the speedy accomplishment of purposes to be attained in that department.

I apprehend that your aim is to acquire proficiency that will enable you to deal with the matter in its various forms, for purposes therapeutic or prosthetic; so that the training of the hand must, for the overcoming of material difficulties, accompany the acquisition of knowledge. For this purpose the student should endeavour to witness operations of varied character, which, in his coming professional life, he may be called upon to perform.

A quick comprehension of the exact requirements of each case, with the power to effect a rapid execution of the same, will materially advance those engaged in the study of dentistry. The "value of minutes" cannot be over-estimated while operating, so that the perfect arrangement of instruments previous to that period may be considered a distinguishing feature in the preparations made. This minute attention to detail, however, must not engender habits of laborious idleness, or detract from the concentration of thought which embraces an entire operation before its commencement.

Each application of the instrument should be made with a specific object, and, the moment that object is attained, the next process must follow in quick succession. If a rest be required, it is to be distinctly taken as such, and not indulged in at the expense of time employed in the operation. An awkward or irresolute manner of selecting an instrument is an evidence that the brain and hand are not in unison. By rapid manipulation I do not wish to convey the impression that I favour undue haste, involving uncertain action or jeopardising the work. But a waste of time is to be deprecated in operations of an extended character, and this, in a measure, can be avoided by a well-defined and accurate calculation of the requirements of any particular case, conjoined with a systematic carrying out of the same.

Refrain from unduly sacrificing any portion of the healthy tooth structure; yet do not hesitate to use the instrument freely upon all surfaces presenting a doubtful appearance, following out the decay, whether interstitial or superficial, to its periphery. Previous, however, to the introduction of gold, presuming that the several walls are carefully shaped and dressed, the finest emery paper may be employed to nicely polish the outer edges of the cavity; as there will always be a feathery or notched condition of the external enamel after the most careful preparation with instruments. When teeth, standing closely impacted, are decayed upon their proximate walls, it is necessary to wedge preparatory to operating, that a proper inspection may be made along the facing surfaces. As a rule, complete exposure of the parietes, as well as of the floor of the cavity, should be made previous to the introduction of the gold; for, if the operation be conducted under the disadvantage of an uncertain light, there must necessarily exist some doubt as to the stability of the work performed.

In shaping the cavities, I would discourage the formation of severe or acute angles, for they are not so easily or solidly filled as when the surfaces are united by a portion of a circle. The walls are also strengthened by this, while an angle is likely to favour the formation of a fissure at the angular point. Having a knowledge of the ramification of the canaliculi with their life-sustaining circulation, which is by some believed to exist in them, try to form the walls of the cavities in lines running—as nearly as possible—in the direction of the dental tubuli. Although theoretically correct, this cannot always be carried out, as the cavities would, in many instances, be the shape of an inverted truncated cone. But, if this object cannot be attained, the aim must be to so shape the cavity that it shall not exceed the perpendicular, thereby avoiding undercutting, which, by widening the floor, must necessarily divide many of the anastomosing ramifications. Undercut cavities do not, as a rule, retain the gold so well as those with vertical walls. Although that form of cavity may prevent bodily expulsion of the filling when loose, it cannot be estimated as an advantage, for a detached filling is better lost than retained in its uncertain tenure of position, deceiving as it does the patient, and not unfrequently permitting caries to extend without the invariable warning being heeded—this false security causing, as it may, the ultimate loss of the tooth.

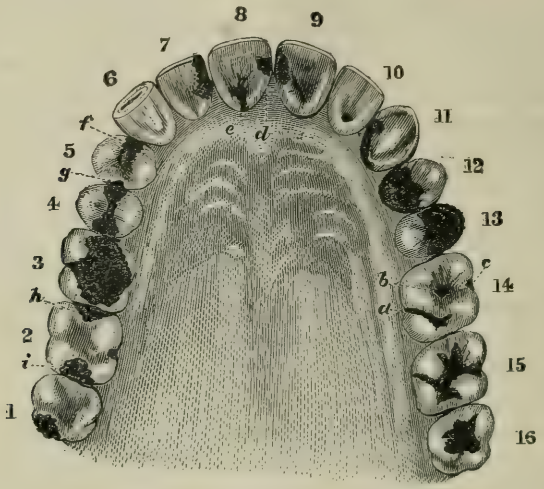

FIG. 1.

Fig. 1 illustrates decay as frequently seen in different stages in the several teeth. I have already in general terms described morbid tendencies as exhibited in the teeth, and, from the fact that these early indications of disease are apt to receive hurried attention, I now endeavour, by the diagram before you, to illustrate cavities of this description as filled (Fig. 2). Here it will be observed that the restoration, as exhibited on the plan of the teeth, may be irregular or even stellate. Disease as herein pictured often commences in an

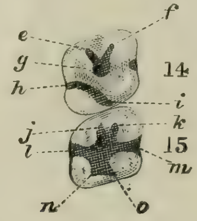

FIG. 2.

In Fig. 2, subfigure 14, *e*, *f*, *g*, may be seen a cavity filled in the ante-proximate-medial point, extending along fissures in the direction of the ante-buccal-medial and ante-lingual-medial points.

In the post-proximate-medial point, the filling extends from the lingui-cervical portion of the tooth, to the post-proximate point, *h*, *i*.

In subfigure 15, *j*, *k*, *l*, and *m*, represent a filling as illustrated in decay in Fig. 1; while *n* and *o* shows the general breaking down of the structure between the previously existing interstitial points, with a coalescing of the same.

insidious manner, giving but little warning of the extensive waste of tissue; but it is sometimes manifested in a form so pronounced that its presence becomes a declared fact at once. The progress in the one is generally slow, in the other much more rapid. If the decay be superficial, with retarded action, it is an indication that nature is assuming the defensive by active resistance to the destructive agencies engaged upon the remaining healthy tissue.

Although subfigure 14 in the above depicts the first stage of disease, it likewise delineates a feature in the preparation of cavities that I may not again have an opportunity of so plainly illustrating. In this figure the greatest depth of the caries is at *g*; *e* and *f* showing the termination of superficial decay, at which points are located anchorages. Situate in the post-medial region will be seen a filling, the necessity for which was caused by decay that had extended transversely across the tooth, radiating from a point in the post-medial to the lingui-medial region, as shown at *h*, and to the post-proximate, as shown at *i*. This form of decay sometimes winds over and upon the lingual wall, until it gradually fades away upon the cervico-lingual border of the tooth. Sometimes upon the occluding surface of the lingual border is found a malformed cusp, with its base surrounded with fissures, some of which are very deep. When decayed at its base, it is better to remove the cusp, and restore its friable foundations to the normal contour of the teeth.

In subfigure 15 we have, radiating in every direction, a restoration of the lost portion of the tooth by filling in the deficiency with gold. The letters *j*, *k*, *l*, *m*, *n*, and *o*, represent the extension of decay, but the filling being superficial in these distal points, and therefore deficient in resistance to change of form, anchorages are necessary in each of the angles and peripheries indicated by the letters. Here will be found an arachnoid spread of caries, which, continuing in the interstices, radiates in every direction from the central point of offence. When these lines of disease are left, they not only increase and insidiously undermine the filling, but they frequently invade the pulp chamber, before any apprisal of danger is made to the patient. It is not necessary for me to add that on the careful restoration of these interstices depends very much the permanent retention of the filling, for the restorations of gold, in this case, are but filaments lying in channels of diminutive size, and would be forced from their point of contact with the tooth, unless well anchored at their distal ends.

Particularly should it be observed that every joining edge be perfect and exactly adapted so as to continue the minute deviations and changes of surface which will occur within very limited spaces on the teeth. This important condition being absolutely fulfilled, the circumscribed outline of the filling, considered as a solid of irregular form, will mathematically coincide with the boundaries of the cavity. To better define my meaning, I would have you notice the different characteristics in the ante- and post-medial cavities; the one being circular in shape, while the other is nearly transverse and extends sometimes beyond the occluding surface and over upon the lingual wall. These cavities require more care than skill, yet it is not an infrequent occurrence to find the operations indifferently performed; especially may this be looked for in the post-medial cavity, where, by the undermining of the work, it becomes necessary to treat the second stage.

In the inferior molars are also found several depressions, favouring the invasion of disease; and, when decay simultaneously manifests itself in two of these dips, the intervening wall is soon broken down, resulting in a merging of both cavities into one. Then, again, there are found small grooves or sulci, diverging at right angles across the tooth, which, unless cut out to their extreme distal points, must necessarily involve the destruction of any work bestowed upon them. These irregularly creeping clefts indicate defective calcification or unification of the enamel, the columns having failed to coalesce at these lines of juncture. The fissures, although imperceptible in a hasty examination, have walls diverging as they approach the dentine, where a morbid condition is induced by the infiltration of the fluids of the mouth through this gateway into the body of the tooth, the dental tubuli fast disappearing under the influence of these corroding agents—disintegration continuing until the disease assumes a more pronounced form.

In the commencement of decay upon the buccal walls of lower molar teeth, where a softened condition of the dentine is found running up to, or near the occluding surface, it is required to use the fissure bur. In the medial-buccal surface, where the cavity is small and circular in form, the fissures above and below being pronounced, are to be cut out and filled, thereby preventing extension of decay, with final loss of the filling. This must be followed out until there shall exist no points intermediate between the central cavity and the peripheral ends of the excavated channels not fairly opened and fully exposed to view.

Before taking up the second section of our subject, I shall occupy a few moments in reviewing some of the incompatibles with gold.

It would be supererogatory to speak of its metallurgy further than to mention that, by various chemical processes, gold is supposed to be prepared absolutely pure for dental purposes.

When we consider that a "single grain, the first cost of which is about twopence, can be beaten out into leaf which shall cover 75 square inches," its wonderful adaptability is at once apparent, so that it becomes only a question to decide in what manner it can be most effectually manipulated for dental purposes.

Considered in its purity, there are many opposing agents in connection with its use that require to be stringently guarded against; and the cause for the recognised differences of "cohesive" and "non-cohesive"—under one or other of which all the preparations of gold used in filling must be included—can only be attributed to peculiar molecular arrangement of its particles, culminated by the mechanical and chemical forces which have been brought to bear upon it.

The condition under which it can exist as a simple body is limited within narrow bounds; for, by the process of annealing, which is simply heating to a blush under certain precautions, the non-cohesive is immediately changed to cohesive. The recognised differences are simple, but there are unrecognised causes of failure which occasionally manifest themselves to the chagrin of the operator; the origin of its intractability being occult or undefinable.

The cohesiveness of metals, like gold and lead, in the solid state, depends upon a chemically clean surface. In the lead such a surface exists at the moment of its being cut. But lead oxidizes, and the thin film so formed very soon prevents cohesion. Gold, a metal of higher virtue, does not so oxidize; therefore, with proper precaution it may be preserved cohesive for an indefinite period.

But, however pure, it possesses the common liability of bodies to come under the influence of the laws of adhesion and condensation. Therefore, foreign substance, as moisture, smoke, the motes of the air, exhalations, and a lack of precautionary measures in removing from the fingers the natural sebaceous exudation, which continually rises to the surface of the epidermis, will act as impediments to its use. Any one or all of these may cause a thin film or deposit, which, although imperceptible to the unaided senses, may be subversive of that condition of surface which alone ensures perfect cohesion.

Experience has shown that, owing to peculiar atmospheric changes, or from reasons not traced, the gold has been capricious or has worked with less facility on certain days. The causes for these irregularities, I believe, would be found as taking their origin in periodical emanations from the busy centres of industry and social activity, towards which the dentist naturally gravitates. That these atmospheric or other hindrances may, as far as possible, be overcome, it is better to procure and retain the gold in a non-cohesive state until required, when it should be properly annealed.

Gold is manufactured into many different forms, among which are ribbons, blocks, cylinders, pellets, crystal, or sponge; also heavy foils, of Nos. 20, 30, 60, and even higher numbers are employed, but No. 4 has thus far stood firmly to its position in advance of all other preparations for general use. The heavier numbers, like sponge, or crystal gold, seem to have had a spasmodic popularity only, for at present both are used in a much more limited way than heretofore. Foil is used cohesive as well as non-cohesive, and both have answered a very good purpose ; some claiming a preference for the soft. Unquestionably, gold, in its non-cohesive state, is a much safer material in the hands of an inexperienced or indifferent operator ; and I am firmly of the belief that cohesive foil has been an injury rather than a benefit to the Profession at large, used as it generally is. Knowing this to be the case, the peculiarities of this metal should be studied.

The resisting properties of gold to corroding influences, as well as its ready adaptability to the inequalities of the surface to which it is applied, causes it to occupy an unimpeachable position as a specific metal to oppose the influences of morbid changes in the teeth. Should there, however, be any dereliction in observing the conditions of its use, these natural attributes seem to become perverted, presenting to the mind a parallelism to moral depravity ; for, while a portion will be amenable to the instrument, there may be an abrupt refusal on the part of the remainder to coalesce, becoming harsh and quite intractable to the purpose for which it is intended.

Cohesively used, however, it possesses undisputed distinctive qualifications as a material for general adaptation over that of gold in a non-cohesive state, and renders many operations—especially in the more advanced stages—possible, that would not be attempted with other material, But the conditions under which it may be employed to secure the full benefit of its co-adapting qualities are so complex, and the inherent difficulties of its application so great, that many operations have failed, not from want of virtue in the material, but from the practitioner undertaking that which was beyond both his powers and experience, and which, with only soft gold to rely upon, would have resulted in the selection of a material more effective in such hands. These failures have been laid at the door of the Profession generally—and to cohesive gold in particular—instead of being attributed to the temerity of some of its members. The plausibility of its use in a cohesive form has been a snare to many, for, although this attribute has its intrinsic value, yet the indications to ensure this primary recommendation are such that the neglect of any of these particulars may endanger the work in cases where necessity for its use is demonstrated. Therefore its employment in a cohesive state has not resulted in an unmixed benefit to the Profession ; in fact, from the reasons stated, so many of its fine working qualities have been negatived by indifferent manipulation, when employed in cases where its application was contra-indicated, that it has been unfavourably commented upon.

I wish to lay particular stress upon the advantage of procuring gold in an unannealed condition. With every precautionary measure upon the part of the manufacturer to prevent change in the foil, previous to its transmission for use, the various causes I have enumerated are ever antagonistic to the preservation of the virtues which particularly recommend it as a filling material. Should a state of pronounced declension be established, a series of complications, greatly to be dreaded, may result. When recourse is had to a second annealing, it will be found, contrary to general expectation, but established as a fact, that the better nature of the gold will be still more perverted, and that it will become stiff, harsh, and tinny.

The simplest application of the foil is in interstices, in grooves, in pulp canals, and very small cavities, where cohesive gold is used by being torn piece by piece from the leaf, with annealing pliers. But in cavities of larger dimensions, the leaves, whether cohesive or otherwise, may be used in a manner adequate to the size of the cavities. Various methods are adopted in preparing it previous to its introduction into the tooth, to enable it to be directed with accurate precision to its destination.

One of the forms favourable to use presents a flat surface. By folding the leaf into four—that is to say, twice in the same direction—a parallelogram is obtained, equal in length to the original sheet, but of one-fourth its width. This folded leaf of gold is then subdivided by cutting across its smaller extension at distances varying from $\frac{1}{8}$ or $\frac{1}{2}$, to a full inch apart; these quadrupled bands being always of cohesive gold.

The folding is at the convenience, or personal inclination of the operator, into fourths, thirds, half of, or even a whole sheet. In the latter cases, the foil is usually rolled into ropes—preferably with a napkin—to effect that purpose. Where the foil is to be used cohesively, these ropes are cut into convenient length, and annealed by being rapidly passed through the flame of a spirit lamp.

Another method of preparing is by crimping, and this is accomplished by laying the leaf on a tin plate, one end of which is bent at right angles to the plane of its surface; while another plate similarly reflected is placed upon the first, the bent ends being on opposite sides of the foil. Guides preserve the parallelism of the plates, which, when drawn in opposite directions, caused the gold to become crimped in proportion as their turned margins approximate each other.

Soft gold, being rolled into ropes and introduced into the cavity, is impressed in layers until it rises above the orifice. By impaction it becomes fixed in position through mechanical force, friction, and interlocking. Where there are good walls against which to pack, great solidity can be obtained, and the filling made impermeable and lasting. Soft gold, in rope form, is perhaps the most expeditious method of filling, and, in some cavities, proves an excellent preservative of the teeth.

Many of the imperfect and porous fillings so often seen result from a too rapid packing, and using gold that is too thick; then again it is often pounded until it really loses much of its cohesiveness; instead of packing against the walls of the tooth, it is driven from them—the excessive vibratory motion partially destroying the close contact previously attained. Light and prolonged tapping will better unite the particles of gold, and also cause it to more readily adapt itself to the interstices in the walls of the tooth when used thin, and introduced with gentle force into the cavity. By an intelligent appreciation of the necessity for co-adapting the molecules, and in proportion to the mass to which force is to be applied, it may be stated that the use of small instruments in condensing will give greater coercive force to its particles than could be accomplished by more diffused, though heavier blows. The necessity for *delicate*, *rapid*, and *light manipulation*, cannot be over-estimated in operative dentistry, as it is the acme of our profession. *In fact, manipulation may be considered the apex of the pyramid, the base of which is knowledge and practice.*

It may be supposed that more time has been devoted to this primary stage and the concomitant preliminary measures than they deserve. The importance, however, of effective treatment at the inception of disease, to prevent the following stages, has its full significance, for upon accurate views respecting it, altogether depends the success of measures adopted.

Your labours will be greatly augmented by causes physiological and psychological, which will admit of no over-draft being made on your stock of vital energies, and, for this reason, I shall endeavour to show in my demonstrations this morning the advantages to be derived from sitting, when engaged in protracted operations.

Although you may not be able to occupy that position continuously, sit as much as possible, even though it be but for a few moments at a time.

The vivid appreciation of the sensitiveness of the field of operations is no mean factor in causing bodily prostration, and I would advise you to adopt every expedient that may relieve you from this waste of nerve tone. To combat these depressing influences you must particularly observe the physiological laws which protect you from results traceable to clearly definable causes.

The very nature of the work which you will be called upon to perform, as well as the compulsory position of the body to be assumed, will speedily draw upon the reserve of physical power, and, should a certain point of exhaustion be reached, may result in perplexity and annoyances little anticipated.

In some cases, there will be found an electric or magnetic sympathy, placing both patient and operator in full harmony; but, in other instances, they may be in a negative condition, expressing either by word or gesture—equally well understood—the existence of such a state of things. This being known, such measures as might prove effective should be adopted to suppress the evil.

Success may lead you to overlook the healthful disciplinary measures of a regular conformity to system; conspicuous among which is the disregard so often evinced concerning fixed hours for meals. The muscles require a reserve of strength, although the touch should be gentle, applied with firm pressure, and directed by the tension of opposing and delicately graduated forces; and this cannot exist without a due observance of this most important principle of health. An atonic condition of body will cause irritation, at a time when contingencies may arise calling for efforts of the most unexpected nature. It is a knowledge of this which brings a sense of responsibility that, unless combated by physiological agencies, may lead to consequences most disastrous; while attention to the ordinary laws of health permit unity of purpose, cheerfulness and an activity of body, the result of energy produced by a normal *vis a tergo* in a healthy organism. Your occupation will be such as to preclude the necessary bodily exercise in the open air, unless the manner of conducting your practice is methodically and systematically arranged; this principle to become a law and unchangeable. None of the professions demand such close observance of hygienic rules as the one you have chosen; and, unless precautionary measures be adopted, your quiescent life will so act upon the mind as to cause it to become susceptible to the influence of morbid impressions and irritations, a diathesis which may be directly traceable—in too many instances—to a lack of mental tone, concomitant with a physically depraved condition.

Considering the important relation of the respiratory to other organic functions of the body, too much care cannot be given to the ventilation of rooms. Especially should this be observed when selecting a room in which to operate, the essentials being unobstructed light, high ceilings and space, that a ready means for free circulation of air may be obtained whenever required. It is a misconception of one of the most essential conditions to operate in a small or close room; and is objectionable in many ways, prominent among which may be mentioned oppressiveness—producing a state of things that will have a marked tendency to interfere with comfort. This, added to the reasons already mentioned, will very materially influence the character of your work.

DENTAL HOSPITAL OF LONDON.

ANNUAL GENERAL MEETING.

The Annual General Meeting of the Governors of the Dental Hospital of London was held on March 9th, Sir Charles McGrigor, Bart., one of the trustees, in the chair.

The report of the committee of management was read, of which the following is an abstract:—

In presenting their twenty-fourth annual report, the managing committee feel pleasure in drawing attention to the increasing interest felt by the public in the hospital as shown by the subscription list, in which the proportion of lay to professional contributors is larger than usual. This, doubtless, is in great measure due to the energy of the lately appointed secretary, of whose labours the committee wish to speak in the highest terms; but they also believe that the general public are gradually becoming aware of the great necessity for Dental Hospitals, and are more disposed to support them.

In recognition of the generous donations from their respective companies, the Prime Warden of the Goldsmiths', and the Masters of the Clothworkers', Drapers', and Grocers' Companies, have been elected honorary life governors of the hospital.

The amount received from the Metropolitan Hospital Sunday Fund was £56 5*s.*, making the total contribution from that fund £557 6*s.* 1*d.*, and the amounts received from the Hospital Saturday Fund were—award for 1880, £28 14*s.* 10*d.*, and for 1881, £34 11*s.*, making the total contributions, £173 15*s.* 7*d.*, the award for 1880 not being received before January, 1881. The donations of life governors during the year amounted to £498 15*s.*, the general donations to £140 7*s.* 7*d.*, whilst the annual subscriptions amounted to £581 9*s.* 6*d.* The gross receipts being £1,786 11*s.* 10*d.*, and the expenditure £1,171 0*s.* 11*d.*, leaving a balance of £615 10*s.* 11*d.*

The committee think it a fit subject for congratulation that, for the first time in the history of International Medical Congresses, a section was accorded to Dental Surgery in the congress of last year. But with this prominent honour come corresponding responsibilities, and the committee cannot too strongly impress upon the governors that if our country is to retain its position, the educational facilities of this hospital must be largely increased; and that, owing chiefly to the costly nature of the materials, this can only be done by a large expenditure of money.

The following is the report of the Medical Committee for the year 1881:—

The Medical Committee are happy to be able to report that the past year has been one of satisfactory progress, as shown by the following statistics of cases treated from January 1st to December 31st, 1881:—

Number of Patients attended		24,600
Extractions	Children under fourteen	5,462
	Adults	8,840
	Under Nitrous Oxide	4,009
Gold Stoppings		1,461
White Foil ditto		100
Plastic ditto		4,710
Irregularities of Teeth treated Surgically and Mechanically		886
Miscellaneous Cases		3,545
Advice Cases		1,786
	Total	30,799

If the above be compared with the table furnished last year, it will be seen that there is an increase, by 2,231, in the number of cases treated, and further—and this is highly satisfactory—this increase consists chiefly in the conservative branch of operations. Of the class who apply at the Dental Hospital the majority will always consist of persons demanding immediate relief from severe suffering, and who cannot afford the time either for preventive measures or lengthened treatment, so that the statistics must ever show an undue proportion of extractions; nevertheless, it is encouraging to find that the poorer classes are becoming alive to the importance of saving their teeth, to which end there was but small opportunity before the establishment of this and kindred institutions.

The Medical Committee have to note several changes that have taken place amongst the members of their staff during the past year.

Mr. C. J. Fox resigned the office of Dental Surgeon, which he had held for many years, and the committee much deplore the long-continued ill-health of that gentleman, which rendered such a step necessary. They have also to regret the resignation of Mr. Ashley Gibbings, who for several years most ably and attentively fulfilled the duties of Assistant Dental Surgeon. The Medical School has, unfortunately, lost the important and valuable services of its talented lecturer on metallurgy, Dr. Louis, in consequence of that gentleman having accepted an appointment abroad.

Mr. Bradshaw resigned the post of House Surgeon early in last year, and Mr. Blackmore, appointed in his stead, recently resigned the same. Both of these gentlemen fulfilled the duties of the office in a manner highly satisfactory to the staff, and conducive to the well-being of the Institution.

In the places of the above-mentioned the following appointments have been made. The vacancy in the Dental Surgeoncy was filled up by the appointment of Mr. D. Hepburn, who had for many years most ably and conscientiously filled the office of Assistant Dental Surgeon. The vacancy caused in the latter by the promotion of Mr. D. Hepburn, and that by the resignation of Mr. Ashley Gibbings, were filled up respectively by the appointment of Mr. A. S. Underwood and Mr. C. E. Truman, gentlemen whose antecedents bespoke the certainty that their connection with the hospital would prove highly beneficial.

The late vacancy in the post of House Surgeon was filled up by the appointment of Mr. Hern, who obtained the Saunders Scholarship and numerous other prizes at the recent examinations at the school.

The Lectureship on Metallurgy has not yet been filled up, but the high qualifications of the candidates for the post guarantee that it will be worthily and efficiently occupied.

Of the general condition and prosperity of the school the commitee can report most satisfactorily. There has been a large increase in the number of students, and the committee have found it advisable, in order to increase the efficiency of the practical instruction, to appoint an additional Demonstrator. That office is now ably filled by Mr. John Ackery, a former distinguished pupil at the hospital. The committee have to acknowledge a valuable present in the form of a handsome gasometer and apparatus, for the administration of nitrous-oxide gas, from Dr. Telschow, of Berlin; also a useful appliance termed a saliva-syphon, from Mr. Marsh, L.D.S., of Colchester.

The staff gratefully recognise the permission accorded by the managing committee to the council of Section XII. of the International Medical Congress, during its sitting in last year, for the use of the operating rooms of the hospital, for the purpose of practical demonstrations and operations by eminent foreign and English dentists, and teachers of dental surgery; and they also thank the managing committee for the promptness with which their requirements, for the efficient performance of their duties, and the successful working of the institution, have been always met.

The resolution of the Governors of the National Dental Hospital, referring to the amalgamation of management of the two Hospitals (mentioned on page 165), was read, but no action was taken in the matter.

NATIONAL DENTAL HOSPITAL.

ANNUAL MEETING.

The Annual Meeting of the Subscribers to this Hospital was held on the 1st of March. In the absence of the President (the Right Honourable Lord Viscount Enfield), H. T. K. Kempton, Esq., occupied the Chair. The Committee of Management presented their Twentieth Annual Report.

The Committee have great satisfaction in speaking of the alterations and additions to the Hospital, for they have been a source of the greatest convenience to the Medical Officers and Students, enabling them to meet the extra demands made upon them, by the increase of the patients during the year, in a manner quite impossible in former years.

The thanks of all connected with the Hospital are due to the artists who so kindly gave their services at the concert, held on the 25rd May, 1881, at St. James's Hall, and also to Mr. Felix Weiss, who took so vast an amount of personal trouble in connection with it; but the Committee have to express their deep regret that, notwithstanding the great efforts made to render the undertaking a success, the financial result was only £9 7*s.* 3*d.* It would scarcely be believed from so small a result that 5,040 letters in connection with the concert were sent away from the Hospital. Not only was this the case, but a considerable sum was also spent in advertising. One result, however, which may fairly be placed to the agitation in connection with the concert, will meet with approval, and that is that the number of patients has increased from 13,176 to 15,249 during the year.

The same bad financial result which attended the concert also accompanied the numerous appeals made by the secretary, and the treasurer's statement of accounts for the year shows a falling off of subscriptions and donations, the former by £17, and the latter of over £100. Against this, however, the payments by patients have increased by over £50, and the conclusion forced upon the Committee by those statistics, taken with the surprising increase in the number of patients during last year, as in the last few years, is that the benevolent public generally do not appreciate the great necessity of Dental Hospitals, while the poorer classes, by the increasing number of their applications, prove them to be invaluable.

In consequence, therefore, of this bad financial year, the Committee, after great consideration and with great reluctance, were obliged to borrow £250 from the bankers to pay off the Hospital's most pressing liabilities; and they take this opportunity of urging their supporters to endeavour to enlist new friends in the Hospital's cause, as debts such as these go far towards retarding a hospital's usefulness—its income, instead of going towards developing the Hospital, being swallowed up in payment of old debts.

A glance at the balance-sheet will show that, notwithstanding this debt, the Hospital is in a sound solvent condition, and it must be borne in mind that liabilities incurred for improving the premises are really increments to the value of the Hospital.

The Committee feel that the lesson of the year is that their endeavours must still be directed towards forcing upon the public this fact, that just as much as General Hospitals are required to produce our world-renowned doctors and surgeons, so is it necessary that Dental Hospitals should exist, and be amply supported, in order that in them students can be trained to become skilled Dental Surgeons. Dental Hospitals are not special hospitals in the ordinary sense of the word, as only they provide, in the most efficient manner, the education necessary to obtain the degree[*] of Licentiate of Dental Surgery.

The Medical Committee reported that the amount of work done at the Hospital during the past year has been much greater than that of any previous year. The following is a statement of the work done at the Hospital from January 1st to December 31st, 1881 :—

Number of Patients attended			15,249
Extractions	Children under 14		4,020
	Adults		6,183
	Under Nitrous Oxide		1,030
Gold Stoppings			787
Sheets of Gold		940	
Other Stoppings			4,035
Advice and Scaling			1,209
Irregularities of Teeth			627
Miscellaneous			1,822
	Total		19,713

It is satisfactory to observe that of this large increase in the number of operations performed (19,713), the quantity of gold fillings was augmented by 245 over the number of last year. This item alone indicates an appreciable improvement in perhaps the most important branch of the work of the Institution.

The Medical Officers and Students experience great comfort, and find increased facilities for prosecuting their labour, from the extension of the premises which has been effected.

Reference having been made to the changes in the Staff during the year, the report continued :—

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[*] Recognised by the State.

The Medical Committee have appointed one of the senior Students, Mr. F. W. Bate, as Assistant House Surgeon, so as to relieve the House Surgeon of much of the simple and routine work, that he may be able to devote time to demonstrations.

The Annual Dinner of the Staff and Past and Present Students was held on November 16th. The event was in every sense a success, and such meetings tend to foster good feeling and to rally the profession around the Institution.

The Annual Distribution of Prizes to the successful students took place on the 3rd of May, when Sir Erasmus Wilson, F.R.S., presided.

The Cards of instruction regarding the teeth are still distributed to the patients, and there is satisfactory evidence of their usefulness, and the benefits resulting from following the advice they offer.

The Reports were adopted.

The question, frequently discussed and urged by the Committee of Management, arose as to the desirability of the amalgamation of the two Dental Hospitals in London, and the following formal resolution, moved and seconded by Mr. Cheeswright and Mr. Oakley Coles, was unanimously passed :—

"That, in the opinion of this meeting, it is desirable an amalgamation of the two Dental Hospitals be made with a view to economy of administration and increased general efficiency."

The hearty thanks of the meeting were accorded to the Treasurer, Committee of Management, Medical Staff, Auditors, Secretary and Chairman, and the proceedings terminated.

EXETER DENTAL HOSPITAL.

ANNUAL MEETING.

The Annual Meeting of the supporters of this Institution was held on the 14th ult., the President, W. H. Ellis, Esq., presiding. There were also present the Right Worshipful the Mayor (T. Andrew, Esq.), the Sheriff of the City (Dr. Henderson), the Rev. W. G. Mallett, and Messrs. F. Townsend, Fox, Browne-Mason, Petherick, Mason, J. H. Batten, G. Franklin, and Henry B. Mason, Hon. Secretary.

Letters of apology for non-attendance were received from the Right Rev. the Lord Bishop of the Diocese, the Rev. J. G. Dangar, Mr. Radford, and Mr. Brand.

The Committee, in their report, said that the number of cases treated, as shown by the report of the Medical Sub-Committee, exhibited a steady increase, and compared very favourably with that of similar institutions in other places. Financially, the Committee had to acknowledge the receipt of three additional Life Governors' donations, besides a contribution from the Hospital Saturday Fund of

£5 5*s*.; while the annual subscriptions had risen from £80 3*s*. 6*d*. to £94 5*s*. 6*d*. The amount received from Life Governors' donations was much less than it was in the first year of the existence of the Hospital; such donations were then especially acceptable for setting up and furnishing the Institution. It was on the annual subscribers, however, that the Hospital must mainly depend for the means of carrying on the work so auspiciously commenced, and it was gratifying to find that the number steadily increases. The Committee had been enabled, through the satisfactory state of the funds, to place the sum of £21 on deposit, bearing interest, in the hands of Messrs. Sanders and Company, Exeter Bank, as a reserve fund to meet any contingency that might hereafter arise, or, if need be, to lay the foundation of a building fund. It was with unfeigned regret that the Committee had to report the loss the Institution had sustained through the death of the late Mr. C. H. Roper, one of the consulting surgeons, who from the first took an active interest in its affairs; they congratulated the subscribers, however, on the appointment of Mr. William Clapp, F.R.C.S.Eng., in his place. Since the issue of their last report the vacancy in the staff of Dental Surgeons had been filled by electing Mr. T. G. T. Garland, L.D.S.I. Looking generally at the work done by the Hospital during the last twelve months, and the energy displayed by the Medical Staff, the Committee feel that they have every reason to congratulate the subscribers on the success of the undertaking.

The Report of the Medical Sub-Committee for the year ending 31st December, 1881, shows the number of cases as follows:—

Number of Patients attended		3,624
Extractions	Children under fourteen	1,059
	Adults	2,276
	Under Nitrous Oxide and Ether	111
	Stoppings	956
	Miscellaneous	727
	Total	5,129

These figures show that the number of cases during the first few months after the establishment of the Hospital had been more than maintained, and prove conclusively that an Institution devoted to the treatment of diseases of the teeth was much needed in the city, and was generally appreciated both in Exeter and the neighbourhood. The financial statement presented by the hon. Treasurer (Mr. F. Townsend), showed that the total receipts had amounted to £160 7*s*. 5*d*., the principal items being—Life Governors' donations, £31 10*s.*; annual subscriptions, £94 5*s.* 6*d.* After investing £21 on a deposit note, as a reserve fund, there was a balance in the bank of £23 10*s.* 5*d.*

The CHAIRMAN remarked that the position in which the Institution stood was very satisfactory. He had in his hand tables showing that the work done compared favourably with that in other similar institutions. In Edinburgh the number of cases was 4,643, and out of these the number of stoppings was 425; in Dublin the number of cases was 5,501, but the number of stoppings was not given. In Birmingham the number of cases was 5,575, and the number of stoppings 773; at Plymouth the cases numbered 1,912, and the stoppings 89. At Exeter the number of cases was nearly as large as at any of those places—almost as large as at Birmingham—, there having been 5,129 cases, out of which 956 had been stoppings. He had also returns as to the number of cases at Liverpool and Newcastle; at the former place the number being 9,788, and at the latter 5,550, but in neither of these cases was the number of stoppings given. The statement as to the working of their Institution reflected the highest credit on the Medical Staff for the work they had done in the past twelve months; he referred more particularly to the number of stoppings.

The MAYOR, in moving the adoption of the report, said it appeared to be very satisfactory. He had no conception until that morning that the Institution was doing such work, and that 5,129 should have been under the manipulation of its surgeons was a matter of surprise. For a city like Exeter, and considering the good work done, he thought there ought to be more annual subscriptions.

The SHERIFF said that from his knowledge of the Edinburgh Hospital he could testify that their Institution compared most favourably with it. He was glad to find that the middle classes were better appreciating the importance of the Institution. Even from a humanitarian point of view, to rescue the poor from unskilful practitioners and chemists, who had no idea of treating teeth in a proper way, was a very great boon to the public. There could be no question that there was no disease more painful than diseases of the teeth, and he was sure the poorer classes appreciated the excellent way they were treated in that Institution, which he hoped would continue to flourish and prove eminently successful.

The Reports were carried unanimously.

Messrs. George Franklin and W. S. Mortimer were re-elected hon. Auditors.

Votes of thanks to the President and to the hon. Secretary and Medical Officers, were accorded, and the proceedings terminated.

ODONTOLOGICAL SOCIETY.

The Ordinary Monthly Meeting of this Society was held at 40, Leicester Square on the 6th ultimo, Samuel Lee Rymer, Esq., President, in the Chair.

Mr. Coleman exhibited a model showing the second or third molar of the left side, occupying a position towards the centre of the palate. He stated that a similar condition had existed on the other side. Mr. Coleman also showed a third upper molar which was implanted with the two buccal roots on the palatine aspect, and the lingual root on the buccal side of the alveolus. He experienced more than the usual amount of resistance in extracting it. A third case was one that occurred in the practice of Mr. Lyons. A female had an upper central and lateral pivoted in 1869, with very little inconvenience and perfect satisfaction. A few weeks ago the roots became affected with periostitis and alveolar abscess, and were extracted. It was then found that both the roots were considerably absorbed, and the pivots protruded from the side of the root canal. Mr. Coleman thought it surprising that there had been so small amount of irritation from the presence of the foreign bodies within the alveoli, though the process of absorption must have been going on for a long time.

Mr. Coleman next cited the particulars of an instance in which he was engaged in removing two temporary teeth from a little girl, aged four and a half years, while the patient was under the influence of Nitrous Oxide Gas. In removing one of the teeth the gag slipped, and while he was replacing it the administrator of the gas observed that the child had ceased to breathe. Artificial respiration was resorted to, and breathing re-established. This incident serves to show the necessity of there being two persons present during the administration of anæsthetics—one who can with undivided attention look after the patient whilst the operation is being performed. Had he in this instance been by himself it might have been possible that he would not have noticed the patient's condition until too late, and another fatal case have been added to the small list of deaths from Nitrous Oxide.

The President was sure there could be no two opinions respecting the presence of more than one person in cases of anæsthesia; and he remembered a case which, he feared, must have proved fatal had it not been for the timely observation and action of a second person present.

Mr. Coleman exhibited an upper central extracted from the mouth of a gentleman aged twenty-five years. When a boy the tooth was knocked out, and after three hours it was replanted, and had remained a useful member for twelve years. Lately it commenced to be painful and was extracted, when the root was seen to be considerably absorbed.

Mr. MARCUS DAVIS showed three little appliances which he had found very useful in practice, two of which were for use with the rubber dam, and the other was a wedge-shaped spring for separating central teeth.

Mr. MORTON SMALE showed a lower model with a very large molar-like bicuspid; also a saliva ejector of a very simple and efficient character.

Mr. WALTER H. COFFIN, F.C.S., then read a Paper "On Gutta-Percha Impressions in Regulating." During the Medical Congress he ventured an opinion which advocated the use of gutta-percha for impressions; those remarks had brought upon him a considerable amount of correspondence, and he thought that a brief description of the points of difference between his mode of working it and the ordinary procedure might be interesting.

He could state, as the result of his experience, that gutta-percha was the simplest and easiest material to use, and one which permitted the most leisure to the operator, the ordinary opinion to the contrary being due to either inferior samples, or improper methods of use, which are copied from one text book to another. Thus directions were given to melt it in a pot or saucepan, and take it out with a spoon; to soften it before a fire or over a flame; to boil a lump of it in water till soft, press in a cup and heat the surface in a flame, any of which processes would inevitably ruin the best gutta-percha, so far as its fitness for impressions was concerned. So also was the use of soap, vaseline, French chalk, &c., quite superfluous. All that was required was a suitable cup, a good quality of gutta-percha, and some hot and cold water.

The cups he used were made of pure sheet tin, about 1-20th inch thick, with cast handles soldered on, and a slit down the centre, by opening or closing which it could be adapted for either high or low palates. It should be everywhere perforated for letting out superfluous material; and care must be taken that it is of such a shape that it can be bitten upon steadily without being liable to slip.

In taking an impression, provide a basin of cold water, and another, lined with a cloth, filled with boiling water. In this latter gutta-percha in tolerably thin sheets is placed, and it immediately softens; it is then lifted out on a smooth stick or glass rod, and just dipped into cold water for a second. It may then be manipulated with wet fingers and placed in the cup. Becoming thus somewhat chilled, the filled cup is put into the hot water again for half a minute, then just dipped into the cold, the superficial chill not harming the material. It is then placed in the mouth, and the patient is told to slowly and steadily close the jaws upon it. It should be kept in the mouth for about a minute and a half; it is then with a firm grasp released from the jaw, quickly removed, and, observing the peculiarity of the substance, at once placed in a basin of cold water, where it should be left until it is convenient to cast, the object being to relieve it from the weight of the atmosphere, which would contort the impression.

The gutta-percha most known in the English market is that made for many years by the Gutta-Percha Company, and that, when freshly prepared, left nothing to be desired, if *not* treated according to the directions sent out by the depôts. A very careful analysis showed this to consist of 56·8 per cent. of very finely ground and pure oxide of zinc, and 9·8 per cent. of vermillion, and 33·4 of organic matter. Its working properties depend, however, on the quality of the gutta-percha itself, which varies immensely in the wholesale market. A satisfactory sample is distinguished by the strong smell characteristic of the fresh gum, its great pliability, toughness, and absence of brittleness when cold, and its freedom from stickiness when wet at temperatures below 212° Fahrenheit. After using a few times it becomes more plastic with heat and gives sharper impressions; but with age and much use it rapidly deteriorates.

An old plaster model can be cleansed by first washing it and then putting some old gutta-percha on to it, the effect being that it takes all dirt from the pores of the plaster, this being about the only purpose that the old gutta-percha can be put to. In regulating cases he found it best not to scrape the models, as the gutta-percha shrinks in sitting, and the plate made to the plaster model fits the mouth closely and tightly. A plaster impression, on the other hand, expands slightly.

He could not but lay stress on the use of pianoforte wire for regulating cases, and he had a number of cases which showed the advantage over ligatures. The springs can be moved in and out, according to where the force is wished to be applied; and, also, the whole thing can be removed by the patients themselves, which is a great acquisition for the cleanliness of the patient.

Mr. Coffin here referred to four cases mentioned by Dr. Kingsley, in his book, which were considered very difficult. Dr. Kingsley got over the difficulty of one of them by a plate, jack-screw, and india-rubber band, and then another plate. Mr. Coffin thought that, from beginning to end, the case could easily have been done with one plate and pianoforte wire.

The President said that he had himself great faith in plaster impressions, but from what he had heard from Mr. Coffin, he should be inclined to again try gutta-percha. Patients certainly objected to the plaster of Paris.

Mr. WEISS, in the year 1856, gave his attention to taking impressions in gutta-percha, and by the kindness of the Gutta-Percha Company, he cut into a great many blocks, and found a very small per-centage of them fit for purposes of the mouth. The way he found it possible to tell a good piece, was by cutting a small portion out of the interior of a block, and if it could be bitten between the teeth into a fine sheet, that was good, but if it broke up it was worthless.

Observations were also made by Dr. WALKER, Mr. COLEMAN, and Mr. STOCKEN.

Mr. COFFIN then briefly replied, and said that Mr. Truman used to go to the company and select the material for which he was celebrated; that the properties of gutta-percha were not entirely chemical, but also physical. With regard to the question of the advantages of it, they were on account of the slight shrinkage of gutta-percha, and it being more easily worked. It seemed to him that dentists were called upon more and more to treat regulating cases. He was only anxious that they should be successfuly done, and that he should be gratified if he had contributed in any way to the end.

The meeting was then adjourned.

ANNUAL DINNER

OF THE LICENTIATES IN DENTAL SURGERY AND MEMBERS OF THE ODONTO-CHIRURGICAL SOCIETY.

THIS Anniversary Dinner was held at the Balmoral Hotel, Edinburgh, on Monday, March 13th, ANDREW WILSON, Esq., L.D.S.Edin., occupied the Chair, and W. BOWMAN MACLEOD, Esq., L.D.S.Edin. was Croupier. There were present—Dr. Peddie, Vice-President of the College of Physicians of Edinburgh, Dr. Littlejohn, Dr. Hunter Mackenzie, and Principal Williams, F.R.S.E.; Dr. Walker, London; Mr. Warwick Hele, Carlisle; Dr. W. Williamson and Mr. P. Crombie, Aberdeen; Messrs. Rees Price and Austin Biggs, Glasgow; Messrs. Walter Campbell and Sime, Dundee; Dr. Smith, Dr. Reid, and Messrs. McGregor, Finlayson, Matthew, J. S. Amoore, J. S. Durward, E. A. Cormack, A. Cormack, J. Mackintosh, Edinburgh; J. Moore Lipscombe, Kilmarnock; N. MacQueen, Hamilton; J. C. Crichton, Perth; D. A. Wormald, Bury. After dinner the usual loyal and patriotic toasts were proposed by the Chairman, and cordially drank by the company.

Dr. PEDDIE then proposed "The Licentiates in Dental Surgery." In doing so he said—The toast with which you have done me the honour to entrust me, is one which I have much satisfaction in proposing, and I am sure it will here be most cordially received. It is, "The Licentiates in Dental Surgery," a body who, from one or other of the British Colleges of Surgeons, have obtained diplomas of fitness to practise their specialty, being found well-educated men, and possessing a certain amount of medical and surgical knowledge in addition to that of dentistry. (Applause.) And the toast implies not merely our best wishes for their individual prosperity, but also an expression of the high estimation in which we hold those arrangements of recent years, by which the Science and Art of Dentistry is elevated, public well-being consequently promoted, and a better status obtainable by the dentist through qualified and legalised registration. (Applause.) When I entered the Medical Profession as an apprentice of the late Mr. Syme, 51 years since—(applause),—dentistry in Edinburgh did not rest on a sound basis. No doubt there were then two or three much respected practitioners ; but dental work was mostly in the hands of illiterate men, whose practice was empirical ; and a large proportion of extractions of teeth was performed in the back shops of druggists, or in private surgeries, or the waiting-rooms of the hospital and dispensary, by apprentices or youthful students. There was then, also, very little regard paid to the causes of affections of the teeth, and their frequent connection with organic disease elsewhere, or functional derangements of the system ; but even the mechanical part of the art was somewhat clumsy work, and the fittings and fixtures often more injurious than beneficial. Besides, teeth supplied were chiefly natural ones, and, I believe, largely obtained from coffins rifled by undertakers, or tombs desecrated by gravediggers or resurrectionists ;—(applause)—so that the wearers of such must probably have had many uncomfortable thoughts as to the mouths in which their masticators had previously resided ! (Laughter). Then, stopping for the salvation of useful teeth was rare in comparison with extraction ; and the latter was performed with that hideous weapon consisting of a bolt and claw,—called the key,—frequently after a fierce struggle, commencing in a chair, but terminating on the floor, (laughter)—in which brute force prevailed, with the too common result of a tooth almost sound, or a wrong one, being torn out with a splinter from the jaws on its back ! There were no anæsthetics in those days to mitigate the horrors of extractions ; and seldom were means employed to prevent the necessity of extraction, or was due consideration given to the consequences which might result from that step. From those days, in the course of years, a gradual improvement in all departments of dental practice took place, and also in the position of the self-educated practitioner ; but with increased demand for dental aid, there was also a greater amount of charlatanry without a more general and adequate advance in the study of dentistry as a science, of which physiology, pathology and other branches of medical knowledge should form a part. But thanks to the London College of Surgeons the way was led in 1860 to a general recognition of the importance of the Dental Profession and the institution of a better order of things ; and ultimately and chiefly through the able and indefatigable efforts of our genial friend Dr. John Smith (applause)—who published on this subject so far back as in 1858, perhaps earlier—the Dental Act of 1878 was passed, followed by the action of the Royal College of Surgeons of Edinburgh and the Faculty of Physicians and Surgeons of Glasgow, whose excellent arrangements for preliminary and professional instruction and examination in view of conferring a license are worthy of all praise. (Applause.) Instead, however, of these measures receiving commendation from all quarters, the greatest abuse was heaped on the Colleges by some of the medical journals, from which better things might have been expected ; for the Colleges were stigmatised as degrading themselves by such condescension and liberality; and disgracing themselves by the sale of diplomas to those who chose to buy them! I need not tell you that these and such like hard things said at the first, and echoed down even to the present time in certain journals, were and are insensate ravings and gross fabrications. (Applause.) You know that the central principles of the Act of 1878 are—first, the prospective provision of a race of competent dental surgeons; and second, that to the General Medical Council—the highest ruling medical authority in the kingdom—is confided the supervision of a curriculum for the education and elevation of the Dental surgeon. That august body, therefore, is responsible for the proper administration of the Act; and this ought to be a sufficient guarantee for the professional competence and position of those on whom the license is conferred. Then, in so far as the Edinburgh College of Surgeons is concerned, all here know—and some of you may have experienced—(hear, hear)—how high the standard is of the preliminary and professional education required by it; and how searching the examinations are of candidates for license; and I doubt not you will agree with me in denouncing the assertions alluded to as entirely slanderous, being advanced without the slightest semblance to the truth. Already the license has done much to improve dentistry, and to raise the position of dentists; and in a few years the change will, we doubt not, be much more apparent; and the wisdom and justice of the legislation of 1878, and the action of the colleges for the public welfare will be generally acknowledged. I shall not occupy your time longer, but ask you to drink to the Licentiates in Dental Surgery, coupled with the name of Dr. Reid. (Applause).

Dr. Reid in replying said—In rising to return thanks in the name of the Licentiates in Dental Surgery, for the toast which has been so kindly given by Dr. Peddie, and so graciously responded to by you, I would, with your permission, Mr. President, premise by taking a short retrospective glance at the Profession, in its position and its progress during the last forty years or so, seeing that the subject may not be altogether uninteresting to the younger members now assembled. Previous to 1841, the Profession had neither status in the eyes of the public, nor yet cohesion in itself. In that year, however, Mr. G. Waite, of London, issued a pamphlet entitled, "An Appeal to the Parliament, the Medical Profession, and the Public, on the present state of Dental Surgery." That was not responded to. In 1842, Mr. Robinson, a distinguished member of the Profession in London, made a movement to raise a Dental Society. It came to nothing. In the year following, Sir Jas. Graham having laid a Medical Bill before Parliament, Messrs. Cartwright, Tomes, Parkinson and others made advances to the College of Surgeons to ascertain if provision for Dental Practitioners could be engrafted on it. They received no encouragement. This rebuff by the College was followed by a long period of inaction, viz., till 1855, when Mr. Rymer, of Croydon, addressed a letter to the *Lancet*, advocating the formation of a College of Dentists. This was followed by him calling a meeting of the Profession for the 22nd September, 1856. It was held at the London Tavern, when resolutions were carried—1st, To organise a society; 2nd, To establish an authorised system of education; and 3rd, To form a committee to carry out the resolutions. This met with no support from the section of exclusives who, in 1843, had made overtures to the College of Surgeons, but who, in the following month, September, 1856, renewed their application to that august body. Shortly thereafter, the Odontological Society was formed, but without any intimation or invitation to the Profession at large—some eighteen individuals only being concerned in its formation. On the 16th December following, the College of Dentists was constituted. A meeting having been held in the Freemasons' Tavern, at which some two hundred of the Profession were present (many of whom were of high standing), a statement was issued to the effect that a Charter of Incorporation, it was hoped, would be obtained, and meantime, a staff of lecturers were appointed and commenced work on the 19th of February, 1857. About this time two bills were being brought before Parliament—Mr. Headlam's and Lord Elcho's—it being provided in each "That no person can be registered under them unless he be a member of some medical or surgical college or corporation." This point having been brought under the notice of the College of Dentists by a circular from Mr. Alfred Hill, a meeting was held on the 4th of June, 1857, when a resolution was passed to petition Parliament that dentists should be exempted from the operation of the Act. A promise was given by both M.P.'s that a clause should be inserted to that effect. The gratitude of the Profession at large is due to the two who carried this point, viz., Mr. Hepburn and Mr. Underwood, both of London. At a general meeting in July, 1858, a protest against a resolution of the College of Dentists to the effect that examination should not be imperative, signed by sixty-eight members, was handed to the president by Mr. Underwood, who then left the room, accompanied by the greater part of those present. So large a body having seceded, the College was left, as a matter of course, in a very crippled condition, and here, craving pardon for digressing, it may be mentioned that the two bodies, the Odontological Society and the College of Dentists, although travelling in parallel lines, towards the attainment of the same good end, were, nevertheless, antagonistic in their views, and much mutual misconception of each other's intentions existed. Of this I had opportunities of judging, from my intimacy with the leading men of both institutions, and therefore I took it upon me to try and bring about a better understanding by arranging an interview between the two motor powers, as it were, Tomes, of the Odontological Society, and Underwood, of the College of Dentists. In this I happily succeeded, and these gentlemen afterwards became the delegates of either body in seeking the best mode of obtaining a diploma—that *sine qua non* to professional status. But to return. The College, owing to the secession of so many of its supporters, having been left in such a crippled state, overtures were made for an amalgamation of the two bodies, the College abandoned its special views in favour of a common cause, and happily the strife, which had already existed too long, was brought to a close by their union on the 4th of May, 1863. Thus ended a very eventful period in the annals of the Profession. Meantime the Medical Bill had passed, the 13th, 14th, and 20th of March of that year (1860) having seen no less than forty-three gentlemen (most of whom were distinguished members of the Profession) submit to the ordeal of examination and receive the dental diploma. Subsequent events need not be gone over here, they being known to all present, in the passing and in the working of the

Bill of 1878. Moreover, I have already trespassed too long, I fear, on your time and patience. Yet I must ask you to bear with me for a few moments, that I may bring under your notice a matter of vital importance, in the education of the candidates for the Edinburgh Dental Diploma, as also for the infusion of a humane element into the practice of our hospital. Without entering on the statistics of treatment during the limited period it has been in existence, suffice it to say that it is highly desirable the resources of Dental practice should be brought into full operation, so far as possible, in lessening the number of extractions, and bringing the percentage of stoppings and other curative treatment up to the average standard of private practice; while, at the same time, the classes seeking relief from suffering are thus being educated up to belief in the efficacy of a mode of practice they are at present profoundly ignorant of, and in which they have no faith. I trust I will be pardoned in noticing this matter, but I do so in two points of view—firstly, that our school may hold its place among others for ability in imparting instruction; and secondly, that humane feeling may guide those administering relief to give pathological treatment, where admissible, a fair trial with patients suffering from what our poet, Burns, has characterised as "The hell o' a' diseases." I beg to return my best thanks for the very complimentary manner in which my health has been proposed on this occasion. (Applause.)

Dr. SMITH next proposed "The Odontological and sister Societies." This toast, he said, was one that required very little to be said in order that it might commend itself to their cordial reception. (Applause). After what they had heard from Dr. Reid, he was sure he need not say much in regard to the Odontological Society. More than a quarter of a century ago, in 1857, its first meeting took place in Mr. Saunders', George Street, Hanover Square, and since that time what that Society had done was too well known to all present to require mention; its grand array of eminent names was too well known to require any panegyric or eulogistic remarks on his part to ensure for the toast a hearty reception. (Applause.) He had been asked to propose the toast before its place on the list in order to allow the gentleman who had to reply for it to leave in time for the London train; but he was sure they would do all honour to "The Odontological and sister Societies," coupled with the name of Dr. Walker. (Applause.)

Dr. WALKER, in replying, said that the Odontological Society of London was now purely a scientific body, somewhat identical with the Odonto-Chirurgical Society. It owed very much to the early Scotch members of the society, and he was pleased to hear Dr. Reid speak of having taken so large an interest in the society in early days. He was a mere lad at the time to which Dr. Reid had referred, and had looked at the association through different spectacles. He knew the men as his teachers. He knew that they had possessed the best intentions, although they did not, perhaps, see how to pilot the Profession through the same channel. He knew Mr. Tomes as his teacher in Middlesex Hospital; also Underwood and Hepburn, ever since he had a footing in London. He believed there were no more honourable men, and though their work in early life was conducted under great disadvantages, those present must congratulate themselves that they had the Odontological and the Odonto-Chirurgical societies doing such grand and good work. (Applause.) They must not look back so much, but must rather look forward, and consider how their societies could do more good work in the future than in the past. He could speak from a personal point of view. He was not a clever man. He could not learn from books only, but he could learn from practical teaching; and if this society would only adopt what they in London had adopted—teaching by clinics and demonstration more than by dry papers—they would largely increase their membership. He had no fear for the students. They had knowledge crammed into their heads, and must make good and honest practitioners. He sympathised with their men of six-and-thirty. They would be starved. Look at such giants as were before him—students who had been taught by the best ability of England, Scotland, and America; and how would old practitioners stand if they did not take them by the hand and show, through the Odonto-Chirurgical Society, what conservative dentistry was and ought to be, and must be in future? He asked them to take practical demonstration under their wing, to admit free all respectable practitioners, to see the very best men work, to show them how to work, and to teach them how they could work, if they would only come and listen and see for themselves. (Applause.) The kindness he had received at this meeting did indeed encourage him. He concluded by thanking the meeting most heartily for the kind reception which they had given to the toast. (Applause.)

The CROUPIER remarked that perhaps he might interrupt at this stage, in consequence of Dr. Walker having to leave, and be permitted to tell him that in the Edinburgh Dental School they were already doing what had only been begun in London. (Applause.) Last year demonstration was a principal department of the mechanical class in the Edinburgh School of Dentistry.

Dr. WALKER said his meaning was that these dentures in every class are to be given voluntarily to the poor.

Mr. MACLEOD—That is so. In our school, however, the patients are charged sufficient to cover cost of material, &c. The students prepare the mouth, and make the denture, &c., under the instruction of the Teacher of Dental Mechanics, or his Demonstrator.

Dr. WALKER—I am only very glad, sir, to find that we shall be only second to a very good first; and I congratulate you most heartily on a thing which we have seen it wise to do in town; but when London once throws open its doors to mechanical dentistry free, that means a great thing.

Mr. BIGGS, Glasgow, also mentioned that in Glasgow the same system had been in force for some considerable time, and that the students had been getting lectures gratuitously.

Dr. LITTLEJOHN, Edinburgh, then proposed "The Odonto-Chirurgical Society." In doing so he congratulated the members on their efforts to raise their position. They had their difficulties, and in that respect the college of surgeons to which he belonged resembled them, for they were at one time trammelled with an inferior class of men, and their great difficulty was to shake themselves free from that class, and assert their position as scientific men. They had the barbers associated with them—(laughter)—and until they shook off these otherwise respectable members of society—(laughter)—the surgeons could not assert their position as scientific men. In like manner dentists had for hundreds of years been associated with druggists, and the blacksmith in his smithy, and he could assure them that their struggle to attain a scientific position had been earnestly watched by the sister colleges. These colleges wished the dentists God speed, and he was sure that nothing but the most important business had prevented the presidents of both being present at that meeting. (Applause.) They found that no sooner did the College of Surgeons emancipate themselves from their connection with the barbers than they at once set themselves, as the dentists were doing, to form societies for the promotion of their common science, and he believed this society was bound together for the purpose of promoting the best interests of their Profession. They had sister societies in London and in Dublin, and without a society in which the members could unite for mutual improvement and reading papers, where would their Profession be? They might have colleges; but they must be brought together as brethren for the exchange of thought and common sympathy. (Applause.) This society was fulfilling its functions, and if he had been present at the meeting that day, as he wished he had been, he would have heard a paper read by his honoured friend on his left (Principal Williams) which would have done honour to any of the Royal societies in London, Edinburgh, or Dublin. (Applause.) The skill of the dentist had enabled the Medical Profession to treat with success diseases of the digestive organs formerly regarded as incurable, and the more dentistry was cultivated as a Science, the greater the assistance it would render to Medicine and Surgery. He coupled with the toast the name of Dr. Smith, on whom he passed a high eulogium, who he remarked might, but for his modesty, have been president of the College of Surgeons, and most certainly would be the next president thereof. (Applause.)

Dr. SMITH acknowledged the toast. So far as the Odonto-Chirurgical Society was concerned, he said, Edinburgh had for long rejoiced in many learned and ancient and honourable associations of the kind, the offspring of that high reputation on which she had ever, and on which she still stood. While she had good reason to boast of the older associations, he was certain that she had equal cause for congratulation in some of the younger ones, and among them the youngest of all perhaps—the Odonto-Chirurgical Society of Edinburgh (applause)—the anniversary of which they were that evening met to celebrate. It was satisfactory to look over the long list of names which that society, young as it was, already comprised; it was satisfactory to observe the number of its workers; and it was satisfactory to perceive the amount of work which had been already done by them. And while the members had done credit to the society, he reminded them that it had not been behindhand in returning the compliment by affording the benefits and advantages befitting the leading Dental society attached to the foremost medical school in Scotland—if he would not be out of place in calling it one of the foremost medical schools in the world. (Applause.) While the members derived these advantages from it, those outside its walls would find it ever alive to the interests of the profession which it represented. The discussion which took place at an earlier stage of that day's proceedings, when his friend, Principal Williams, gave such an able address, showed the advantages and the importance of such a body in looking after, and regulating and modifying all the legislative measures which were put forward with the view of elevating Dental surgery to that high position which it already occupied. (Applause.) In whatever way they looked at the society—either in its efforts to advance education and cultivation among the students, or in its administrative capacity towards its older members—it must be always regarded as a society useful in every aspect to the Profession. It had lately been very prosperous, and its prosperity had been put to good purpose. The various journals of the Dental literature of the day had been long open to students, but however much these journals might have conduced to assist in exciting a desire for knowledge on the part of Dental students—however much they might have assisted in affording that knowledge, or enabling students to draw conclusions from what was given them in these journals, still, it was thought that knowledge so derived was apt to become somewhat limited and superficial ; and, with the view of averting this disadvantage, it was believed that a library, including some of the larger works, the more special monographs, the higher and more comprehensive treatises of the authorities in medicine and surgery of this and other countries, might conduce to the improvement of the students. In that way a valuable library had been collected by the Odonto-Chirurgical Society, and had been thrown open with certain restrictions to students of Dental Surgery in Edinburgh. Another mode of instruction equally instructive, and more attractive to some minds —an interesting museum—had been thrown open to students on the same conditions. In this way the students who came to Edinburgh, and who might be, at a youthful age, far from the domestic hearth, were enabled to devote what might otherwise be their lonely evenings to a course of study which would conduce to the feeling that not only was knowledge power, but that the acquisition of knowledge was a positive pleasure. (Applause)

Mr. Walter Campbell, L.D.S., Dundee, next proposed "The Licensing Bodies," and in the course of his remarks said he was sure they could not adequately thank the four honourable, great, and learned societies for what they had done for dentists. In the first place, if he could take it upon him to speak in the name of humanity, he would whisper into their ears how thankful all were to them for looking after the Dental arrangements of Her Majesty's lieges. They looked after, more or less, "all the ills that flesh is heir to," and as their friend, Dr. Reid, had reminded them of that horrible ill that their national poet referred to so graphically, they had added it to their list, and would take care that humanity would be attended to by those properly qualified to do so. And if he might speak in the name of the Dentists, he would thank them for what they had done in taking them under their great wing. There might be differences of opinion with regard to the Dental licenses which the different bodies gave. Some thought that certain of the bodies were too severe in their examinations, and there were others who thought that one or two of them were, perhaps, too lax, and that they gave their degrees too cheaply ; but depend upon it they act honourably, wisely, and well. He was very much pleased, therefore, to hear their esteemed guest, Dr. Peddie, give the lie direct to those insinuations regarding the selling of diplomas by any institution such as either of their licensing bodies. (Hear, hear.) The thing was so dreadful to comtemplate that it was well to give it the lie direct. (Applause.)

Dr. Littlejohn, whose name was coupled with the toast, replied, and assured the meeting that all the licensing bodies were actuated by a sincere desire to assist the Dental Profession to rise in scientific position. For the College of Surgeons, he could say that it conducted the examinations in a careful spirit, and with an earnest desire that the candidates should be carefully tested. He had frequently seen young men, dental students, put to a severe test in chemistry and stand it as well as any medical student could have done. He came into contact not only with the examiners of his own college, but with gentlemen of the Dental Profession who acted as assessors, and some of whom he saw present, and he was sure that their intercourse had been most agreeable, and that they were not only thoroughly impartial, but conducted the examinations as if they had been brought up to that work. (Applause.)

Dr. D. A. Wormald then proposed "The Edinburgh Dental Hospital and School." In speaking to this toast he said that, considering the circumstances by which they were surrounded, and considering the position in which legislation had left them, they must now hold up the future of their calling. This society, having commenced and having now in useful working order one of the training schools which would influence the future of their Profession, it gave him great pleasure to propose, in that city, a toast so suited and interesting to a gathering of dentists; and he felt sure of this that, under the fostering influence of its worthy Dean, Mr. Macleod (applause), and ministered to by the sacrifice of time and service of ability of the various officers connected with that institution, the Edinburgh Dental Hospital and School would worthily fulfil its position as one of the training schools of the kingdom. He could only hope that as time rolled on the same unity which characterised the Dental Profession of Edinburgh would grow more and more throughout the other centres of the country, and that the interest shown in regard to the hospital and training school would influence the students who would year by year be turned out from its doors. He hoped they would prove themselves worthy of the reputation of that university seat, worthy of the influence by which they were surrounded, and that they would do what they could to ease the trammels of suffering humanity, and be worthy of the members of a great and noble calling. (Applause.)

The Croupier, in responding, said he could assure Dr. Wormald that it had ever been the endeavour of those connected with the hospital and school to make it worthy of the reputation of the city in which it was placed. But, more than that, it had been their strongest endeavour to make it worthy of the profession to which they belonged. (Applause.) He could assure Dr. Wormald that the Edinburgh Dental Hospital and School had met with a measure of success which was quite beyond the anticipations of its projectors. (Applause.) The number of its pupils had increased year by year, and he was happy also to say that as these pupils increased in numbers the interest and zeal of the Dental officers connected with it had increased likewise. At the present moment they had on the roll of students a number far beyond their hopes; and not only were they great in number, but, what was better to know, they were a credit to it, and would certainly be a credit to any school in which they might possibly be. (Applause.) A good deal had been said in connection with hospital practice, about the number of teeth that were extracted in comparison with the number which were conserved. In looking over their books that morning it gave him very great pleasure indeed to be able to assure the gentlemen around the table that, so far as the Edinburgh School was concerned, that stain was rapidly being wiped out. It was a matter of regret to the staff that, when giving out the last report, the proportion of extractions to stoppings was so small; but he was happy to say that since the beginning of this year the per-centage of stoppings had increased by about 100 per cent., and that if this continued till the end of the year they would be able to present a report which would do good to, and make glad the heart of the most conservative dentist. (Applause.) With these few remarks he had only to thank Dr. Wormald for his kind wishes towards their school, and to assure him that it would be the endeavour of the staff in all time coming to make that school worthy of the city, and worthy of the Profession. (Applause.)

Mr. Finlayson, L.D.S., in proposing "The Visitors from a Distance," congratulated them in possessing that *esprit de corps* which found no barrier in time or distance to cultivating Professional intercourse, and expressed a hope that they would carry tidings of the fraternal nature of their meetings to friends at a distance, and that on future occasions they would bring others to join the ranks of the society. (Applause.)

Mr. Rees Price, Glasgow, replied in suitable terms.

The Chairman next gave the toast of "Absent Friends," and referred to the absence of, amongst others, the Presidents of the College of Physicians and Surgeons, Dr. Heron Watson, Dr. Joseph Bell, Mr. Cormack, and Mr. Hepburn, who were detained by indisposition or business.

Mr. Lipscombe proposed "The Chairman," and Mr. Crombie, Aberdeen, "The Croupier," and these gentlemen briefly replied.

The company then separated.

SOME OF THE INDUSTRIAL USES OF THE CALCIUM COMPOUNDS.

The following is an abstract of one of the Cantor Lectures, recently delivered before the Society of Arts, by Thomas Bolas, F.C.S.:—

The sulphate of calcium, although it is neither so abundant nor so important from an industrial point of view as the carbonate, has properties which are perhaps more interesting and noteworthy in themselves. Sulphate of calcium is, perhaps, as widely diffused as the carbonate, being present in almost all spring waters and soils, but we do not meet with compact masses of the sulphate which are at all comparable in magnitude with the larger deposits of calcium carbonate.

In some instances, the sulphate and the carbonate occur together in the same mineral, as in the case of the so-called montmartrite, which is so abundantly found in the neighbourhood of Paris. Sulphate of calcium occurs in the anhydrous form. When combined with two molecules of water of crystallisation, it presents the various forms of gypsum or plaster stone ; among which may be mentioned the earthy or almost amorphous varieties, the clear and nearly transparent forms, often known as alabaster ; the fibrous kinds, and that which is crystallised in flattened prisms, and is known as selenite. In this country, the principal deposits of calcium sulphate which are useful industrially occur in Nottinghamshire, Leicestershire, and Derbyshire ; but notable quantities occur in Cumberland, and smaller deposits in Sussex, Kent, and Somerset. Few countries are without tolerably large deposits of gypsum in one form or another, and Switzerland, the Tyrol, Sicily, the United States, some of the South American districts being notable in this respect. Apart from these localities, the immediate neighbourhood of Paris stands pre-eminent ; but the gypsum found there usually contains over 10 per cent. of carbonate of calcium, not, as a rule, in intimate union with the sulphate, but interspersed in the form of grains. This carbonate gives the Paris plaster some of its most useful properties as a constructive material. The flat crystalline prisms, like the amorphous masses of gypsum, contain $CaSO_4 + 2\ H_2O$, and if you reckon this out, it will correspond to nearly 21 per cent. of water. Sulphate of calcium is soluble in about 525 parts at the freezing point, and in 466 parts of water, at a temperature of 38° Centigrade. As the temperature is elevated above this point, the solubility of the sulphate of lime diminishes until, at a heat of 150° Centigrade, it becomes almost insoluble. The presence of certain saline bodies notably increases the solubility of sulphate of calcium in water ; sodium chloride, or common salt, to a moderate extent ; while sodium hyposulphite increases the solubility of the gypsum about eightfold. This circumstance gives chemists a useful method for effecting the analytical separation of barium and calcium. The crystallisation of gypsum from warm water, or from water containing a little hydrochloric acid, is a pretty experiment, and as the solution cools, fine needle-shaped crystals of the hydrated sulphate shoot out, and form tufts nearly resembling the crystals of sulphate of quinine. Here is a sample of the hard and stony sulphate of calcium, which separates from water when it is evaporated in a steam boiler, and you know well how severe accidents frequently happen through the undue accumulation of such incrustations. In connection with this matter, you will not forget that at a temperature of 150° Centigrade, sulphate of calcium is nearly insoluble in water.

Sulphate of calcium is readily obtained in a state of purity by precipitation, when a soluble calcium salt is mixed with a sulphate in solution. Here is a moderately dilute solution of calcium chloride, to which will be added some sodium sulphate, and after a few minutes the deposition of the calcium sulphate will commence, the precipitate consisting of minute needles, similar to those obtained by deposition from warm water, but somewhat smaller. Sulphate of calcium fuses at a bright red heat, and on cooling assumes the crystalline state.

One of the most remarkable circumstances in connection with sulphate of lime is the fact that when the crystals are heated sufficiently to drive off two-thirds of their water, that the residue possesses the property of rapidly setting or hardening when mixed with somewhat more water than that which was originally driven off. In this case it appears that chemical union with the added water takes place, and that the original body, $CaSO_4 + 2\ H_2O$ is reproduced.

When plaster of Paris sets, or the partially dehydrated gypsum reunites with the water which was driven off in the baking, a perceptible amount of heat is produced, an elevation of temperature to the extent of 30° Centigrade being often observable.

The residual water of plaster of Paris may be replaced by certain saline bodies, as, for example, alum, sulphate of potassium, or borax, these substances being generally added to the baked gypsum in the form of solution; after which it is subjected to a somewhat higher temperature than before—a temperature which would dead-burn ordinary plaster. These cements (Keene's, Martin's, and Keating's) set in a few hours, and ultimately become so hard as to be capable of receiving a high polish.

The various kinds of stucco consist essentially of plaster, to which slaked lime may have been added, a solution of size being used for mixing; these additions causing the material to set sufficiently slowly to enable the mixture to be worked in the pasty or dough form. The applications of plaster in its various forms are numerous and important.

The use of a selenitic or gypsum mortar is of advantage in many cases, the usual thing being a mixture of well-burned gypsum and lime; samples which are known to have been used over 350 years ago, being now in excellent condition and harder than the stones which are cemented. In Paris, various kinds of gypsum mortars are in general use, raw gypsum and other invert materials being often intermixed. It will be remembered that the plaster used in Paris contains free lime or carbonate of lime according to the degree of heat to which the raw stone has been subjected.

Plaster of Paris makes admirable drying tiles for laboratory or manufacturing use; its porous structure rapidly removing and carrying away moisture from any wet and insoluble powder. The operation of stereotyping affords a good illustration of an important use of plaster of Paris. Here is a forme of type, the surface of which is slightly oiled. A border being placed round the edges of the forme, you see that liquid plaster is poured on, the production of air bubbles on the surface of the type being prevented by dabbing through the liquid plaster with a camel's hair brush. In a few minutes it will be sufficiently set for removal from the type, but in order to expedite matters, a similar cast was prepared before the lecture, and is now dry and hot in yonder gas oven. The hot cast is now placed face downwards in this flat metal pan, which is also hot; and after it has been properly secured, melted type metal is allowed to flow between it and the bottom of the pan. Sufficient has now been run in to thoroughly cover the cast, and this gas burner will keep it melted until the end of the lecture, after which it will be allowed to cool, when a cast, free from air bubbles or defects, is likely to be obtained.

Imitation marble can be made by mixing plaster to a pasty constituency, with a dilute solution of size, the repuired pigments being added. When the differently-coloured plasters have been incorporated, and the articles have become hard, the material is soaked with linseed oil, and polished with turpentine and wax. The mineral tripolite, which consists principally of silica, lime, and protoxide of iron, yields a quick setting cement when slightly calcined, and may be used instead of plaster in many cases.

NEW INVENTIONS.

BAILEY'S PATENT BEE MOTOR.

THIS is a most ingeniously constructed Gas Engine, and promises to be exceedingly useful to Dentists for driving the dental engine, lathes, &c. The comsumption of gas is very small, being about four feet per hour for a $\frac{1}{20}$ of a horse; the motor being 2 ft. 4 in. in height, and occupying an area of about 15 inches square.

MR. PEDLEY'S DROP BOTTLE.

MENTION was made of this invention in our report of the proceedings of the Odontological Society for January. An illustration of the Drop Bottle will now be found on page IX. of the Advertisement Sheet. By merely tilting the bottle and pressing on the piston, one or more drops of fluid may be obtained. It being self-closing, its convenience for volatile fluids will be apparent.

HOWARTH'S FLASK.

THIS is a convenient three-part flask, and the guides are sufficiently long and parallel to permit the use of a diaphragm, if desired. The clamp is an important feature, having a strong spring which, when liberated by the screw, keeps a constant pressure upon the flask during vulcanization, and effects its perfect closing.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

THE USE OF TITLES.

To the Editor of the DENTAL RECORD.

SIR,—My thanks are due for the insertion of my letter on the "Use of Titles," in the November issue of your valuable journal. I have seen the letter by "Ilex" on the same subject in this month's (December) issue. Will you kindly allow me space for a few further remarks? In answer to my letter you say:—

"A registered dentist may use what abbreviations he pleases, providing he has a right to do so."

You do not say what a registered dentist has a right to use.

Will you, or some of your readers, kindly answer the following questions:—

1. Is a registered dentist licensed to practise dental surgery?

2. Does L stand for licensed?

3. Is a registered dentist so registered or licensed by the Royal College of Surgeons of England?

4. If not by the Royal College of Surgeons of England, then by what college is he so registered or licensed?

5. Is it possible for a man in England to practise dentistry openly without receiving a license to practise dental surgery as specified by the Dentists' Act, 1878?

6. Is a registered dental surgeon of England a licensed dental surgeon of England—never mind about any college, it is a question of lawful claims under the Dentists' Act, 1878?

7. What lawful authority had any body of men to grant an L.D.S. diploma (any more than I had myself) before the passing of the Dentists' Act?

8. Independent of any body of men or any college whatsoever, did the Government of England, by passing the Dentists' Act, 1878, give a license to a considerable number of practising dentists to practise dental surgery, and if so, would a man be entitled to say, "Licensed to practise Dental Surgery by the Government of England," otherwise a Licensed Dental Surgeon of England? It therefore would be in initials, L.D.S.Eng.

9. In the face of the fact that the Dentists' Act gives a license to practise dental surgery to a certain class of men and women in spite of any college, will you kindly, Mr. Editor, say, if you possibly can, what or which corporation would sustain any infringement of their jurisdiction by using "L.D.S.Eng." by a registered dentist? If the L.D.S. men by examination do not like the similarity of title caused by the Dentists' Act, they must alter the style of their title, and not us, and not want to twist and twine the Act to suit them. We obtain our title from Act of Parliament.

10. Can any corporation of doctors or dentists derive or obtain any jurisdiction without an Act of Parliament? And "Did the L.D.S.Eng. first get its lawful authority from the Dentists' Act of 1878," and, if so, "Did the Dentists' Act confer it on all dentists alike, or only a few?"

11. If a person was surgeon dentist before the passing of the Dentists' Act, and becomes registered, is that person a registered Surgeon Dentist of

the Royal College of Surgeons of Eng.? And if not of the Royal College of Eng., then of what college is he a surgeon dentist or dental surgeon?

"Ilex" says he is extremely sorry for the "South African Dentist," but will he answer to the satisfaction of the law my question. If he cannot do so I shall feel inclined to be sorry for him.

I take up my pen not for selfish motives. I was one to petition Parliament against the passing of the Dentists' Act, which, in the interests of humanity, ought to be repealed; and I am now simply defending myself against those placed in power by that Act, but who have misused that power, *vide* the Irish *sine curriculo.* The dentist of whom I complained (in my last letter to you) has advertised his Irish diploma very extensively. So much for the agreement to surrender the diploma if advertising was indulged in.

And now, Mr. Editor, I conclude by asking you to kindly publish the following letters, whereof the enclosed are true copies, the only conditions I stipulate being that you suppress the names and addresses.

I remain, Sir, your obedient servant,
A SOUTH AFRICAN DENTIST.

Cape Town, November 30, 1881.

SIR,—I am* arranging a corrected list of all dentists licensed by the Colonial Government for 1882 of persons possessing special qualifications from some recognised medical college, or registered under the Dentists' Act, 1878.

As I observe you have located yourself at the above address, will you be good enough to inform me the date of your colonial† registration, with your full name and what qualification I must add to your name, and the date of it. Registered dentists simply put, "In practice before July 22, 1878." If you have not received the colonial license‡ to practise as a dentist I must request you to send in your papers at once‖ to the Colonial Secretary, in order that the list of licensed dentists can be correctly made out for 1882.

Yours truly, A.

REPLY.

Cape Town, December 2, 1881.

SIR,—I am in receipt of your communication of the 30th ult.

I am, yours, &c., B.

Cape Town, December 8, 1881.

DEAR SIR,—Yours of the 2nd inst., in reply to my communication of the 29th November, to hand. As it is my intention to address the Colonial Government on the subject of persons practising dental surgery without a license,¶ in justice to yourself I deem it my duty to inform you of my intention.

Yours truly, A.

REPLY.

Cape Town, December 9, 1882.

SIR,—I am in receipt of your communication of the 8th inst.

I am, yours, &c., B.

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* By whose authority he does not say.

† There is no Dentists' Act in these colonies.

‡ There is no body in this colony with any more lawful authority to grant a license than I have, or to prohibit anyone from practising dentistry in these colonies, whether registered under the English act or not.

‖ It is needless to say that my papers have not yet been sent in.

¶ A vile insinuation.

[1. and 3. No. The *Dental Register* is the State Roll of dentists permitted to practise, whereas a licentiate in dental surgery is a person who possesses that qualification from (4) one of the Dental Examining Bodies, of whom there are four--Eng., Edin., Glas. Ire. See Section 19 of the Act.

2. See 8.

5. Yes; if he be registered according to the Act.

6. No; registration is not a license.

7. The R.C.S.Eng. received a charter in 1859. See Section 21 of the Act.

8. The Dentists Act does not confer a license to practise upon anyone; by it those who were practising dentistry at the time of it passing were permitted to continue that calling. The accepted interpretation of L.D.S.Eng. is Licentiate in Dental Surgery of the Royal College of Surgeons of England, and anyone using those letters after his name when he does not possess that license, is a question of fact for a magistrate whether there is any wilful and false pretence. See Section 4 of the Act.

9. As already shown, your premised "fact" is an error.

10. Every corporation granting registrable medical, surgical, or dental degrees has its parliamentary powers. See 7 and 8.

11. Not necessarily. If he does not possess a qualification, but is registered, he may use the title, Surgeon Dentist or Dental Surgeon. After August, 1879, registration can only be obtained by Licentiates in Dental Surgery, except where the provisions for certain students apply.—Ed.]

THE TRADE IN DENTAL DIPLOMAS

To the Editor of the Dental Record.

Sir,—I have it on good authority that the Glasgow examiners are not dealing fairly in diplomas. One of the examiners says that they do not pass those who are most deserving, or who answer the most questions correctly, and that they give the preference to Glasgow men so as to put down advertising there. That for appearance sake they must pluck some. I am quite prepared to substantiate all I say, and more.

I am, yours truly,

JAMES HARDIE.

Alloa, February 22, 1882.

THE EXPANSION PLATE.

To the Editor of the Dental Record.

Sir,—As an independent observer of the recent correspondence in your Journal respecting the first use of the Sectional Expansion Plate, and being well acquainted with both parties in the controversy, I think it no more than justice to Mr. Peter Headridge, L.D.S.I., to state a few facts (as Dr. Coffin so emphatically denies the statement by Mr. Headridge, which I know to be correct).

I received from Mr. P. Headridge about the same time as Dr. Coffin the idea which the former so legitimately claims as his own, and I shall for ever feel grateful to him for it, for it has placed in my hands the means of regulating cases successfully which would have been impossible with the old plan which Dr. Coffin employed. My personal knowledge of the invention is of one most certainly introduced by Mr. P. Headridge, and I must express my astonishment that Dr. Coffin should even by implication seek to make it otherwise. He gains nothing by a multitude of words, the simple fact remains that Mr. P. Headridge was the real inventor of the Sectional Expansion Plate and the first to use it.

I don't know what Dr. Coffin and his son means us to understand in speaking of the springs used by Mr. P. Headridge as being made of pure steel, hard steel, tempered steel, and, lastly, soft steel. The wire I received from Mr. P. Headridge in 1867-8 was "piano wire." A portion of the same was afterwards sent to Dr. Coffin, for the reasons stated by Mr. P. Headridge, that he found him using "knitting needles." I can assert most positively that at the time I was a pupil, Dr. Coffin had no knowledge of any "Sectional Expansion Plate." I think it would have been much more manly in Dr. Coffin, or those who write on his behalf, to acknowledge at once his indebtedness to Mr. P. Headridge. We do not want to be victors in a dispute: merely to establish truth, and to have the simple facts of the matter put in small compass. To acknowledge at once what is due to an "old friend" would be, to say the least of it, becoming.

The facts are palpable to every one who has made himself really familiar with the correspondence. The reference made to what had been "discussed" in America are altogether unsubstantiated. Where is there any authentic report of the discussion? Without such a report no allusion to it can be received. The bold statements of one who has had no opportunity of verifying them must also be declined.

I am, &c.,
JOSEPH WILLIAMS, L.D.S.I.

Hollinwood House, Fallowfield,
Manchester.

Editorial.

THE PRELIMINARY EXAMINATION.

Our readers will not be unacquainted with the inquiry recently instituted as to the position, in point of time, which the Preliminary Examination should occupy among the subjects of the Dental Curriculum. It will be remembered that, in November last, Prof. Turner brought the question before the Medical Council, and, in consequence of that, a letter was sent by the Registrar to the several corporations concerned, asking for their views on the matter. The replies which were received we published on page 75, and there was very considerable difference between the requirement of the Royal College of Surgeons of England and the opinion of the Faculty of Physicians and Surgeons of

Glasgow. The former College maintains its regulation, that in no case can any part of the Curriculum (which includes three years' mechanical instruction) be taken out before passing the Preliminary Examination; and the Edinburgh College is practically of the same opinion, with the qualification that a certificate of such three years' extramural instruction shall, in itself, be valid, whether counting as Professional study or not. The Faculty of Glasgow is much more easy in the opinion it has expressed.

The importance of this question has been recognised by the Odonto-Chirurgical Society, and it was discussed at the meeting of the Society on the 13th ultimo. It was then resolved that—"Although the Society are of opinion that the three years' mechanical training are, and always must be, an essential part of the professional education of the dental surgeon, they do not consider it necessary that the Dental Student should be compelled to pass the Preliminary Examination in arts until prior to beginning his hospital and surgical studies."

When we last wrote upon this subject, it was intimated that it would be desirable to have the opinion of the representative Association of the Profession upon this item of the Dental Curriculum. Unity is strength, a principle which the Association does not fail to inculcate, and equality in the educational requirements for the only Dental degree of the United Kingdom would tend to greater concord than at present exists. But as yet the official organ of the British Dental Association has not informed the members of any steps having been taken in this matter.

GOSSIP.

Dr. W. V. Snow states, in the *British Medical Journal*, that he has for several years largely employed dry antiseptic inhalation in phthisis. He uses as a respirator a simple tin-box, perforated and shaped to the mouth. The patient is directed to place a few drops of the carbolic solution on the tow in the box, and to use the respirator for ten minutes after the morning cough, and at intervals during the day. Many habitually use it for hours while reading. If dryness and irritation of the mouth and throat be caused by the carbolic inhalation, other remedies may be substituted—such as terebene and eucalyptus oil.

William Hern, L.D.S.Eng., has been appointed House Surgeon to the Dental Hospital of London; and Walter Harrison has been appointed Assistant House Surgeon to the same Institution.

THE beaver, with his sharp chisel-faced, front teeth, will cut down and carry off trees as big as a man's thigh, gnawing the wood all round, but cutting it higher on one side, so as to determine the direction of the fall. In one place on the banks of the Missouri, *Items* states, the timber was completely penetrated for a distance of three acres, and in great part removed, although the trees were very numerous and of considerable size. So hard is the enamel of the beaver's tooth that when fixed in a wooden handle it makes a very respectable chisel, and, according to Sir John Richardson, it is used by the Northern Indians to cut bone, and to shape their horn-tipped spears, &c. The incisor teeth of the agouti, another of the rodents, are used in the same way by Brazilian Indians to fashion the blow-tubes, with which they bring down small birds and monkeys. What the little beaver does for building materials, the gigantic megatherium appears to have done for food. This huge extinct sloth seems to have had for its pleasing task to uproot and tear down large trees for the purpose of feeding on the branches.

MR. W. ELLIOTT, a Dentist, practising at Kingsbridge, South Devon, shot the daughter of his landlady on the 4th ult. As her life was considered to be in danger, her depositions were taken by a magistrate. She stated that Mr. Elliott attempted to enter her room, when she closed the door; he then obtained a gun and fired a shot through the panel, striking her in the face, and some of the charge lodging in the opposite wall. Elliott also pointed the gun at the female servant, but said he did not intend to shoot her. To those who arrested him he admitted that he meant to kill Miss Polyblank. The unfortunate young lady was not expected to survive.

AN inquest was held at University College Hospital, on the 15th of Feb., on the body of a woman who died from the effects of an overdose of nitric acid, taken to relieve toothache. It appears that the deceased woman, who had sent to a druggist for twopennyworth of the acid, put the mouth of the phial to the affected tooth, and tilted it up so high that she swallowed nearly the whole of the contents.

AT the annual meeting of the Western Counties Idiot Asylum, recently held at Truro, it was stated that there were in England as many as 30,000 idiots, or about one to every 350 of the population.

A CHAIR of Pathological Anatomy has been founded at the University of Aberdeen, by Sir Erasmus Wilson, F.R.S., and endowed with £10,000.

In his first lecture, in connection with the Electric Exhibition, at the Crystal Palace, Prof. Thompson gave an historical *résumé* of the progress of electrical science, and, after referring to the relation between the power of electric currents and the power that is spent in producing them, spoke of the certainty that in the near future all heavy mechanical work will be done by electric currents in the place of steam. Developing the question of the production of electric currents in voltaic batteries, the lecturer referred to the discovery that such batteries were reversible, and that in this reversibility lay the newly-discovered power of storing or accumulating electric energy in cells which could be charged and discharged at pleasure. The magnetic, thermal, and physiological properties of the electric current were illustrated experimentally, the lecturer remarking with much emphasis that the mistake of confounding physiological with medical or remedial effects led to the gross impositions of the quacks and rogues who deal in so-called magnetic appliances. The nature of electric currents was reverted to, and an outline given of the theory of Clerk-Maxwell that all electric phenomena are due to actions going on in the thin medium that fills the whole universe—the ether—vibrations of which are light and heat, the accumulations of which are electric charges, the streams in which are electric currents, and which, where it was made to spin round in vortices or whirlpools, gave rise to magnetic attractions.

A GENERAL desire having been expressed by the Licentiates in Dental Surgery of the Royal College of Surgeons of Edinburgh to mark their appreciation of, and esteem in which they hold the Diploma, it is thought they cannot better give expression to that appreciation than by establishing a Fund for providing an Annual Prize to the most proficient Student or Students in the Edinburgh Dental School. Mr. McGregor, L.D.S.Edin., 20, Queen Street, Edinburgh, has consented to act as Treasurer to the Fund.

MR. S. J. HUTCHINSON, M.R.C.S., L.D.S.Eng., has been appointed Dental Surgeon to the Dental Hospital of London, *vice* Mr. Alfred Coleman, F.R.C.S., &c., resigned; and Mr. G. W. Parkinson, M.R.C.S., L.D.S.Eng., Assistant Dental Surgeon to the same Institution.

DR. GALIPPE, Superintendent of the Laboratory at the Paris Faculty of Medicine, has, under the direction of M. Jules-Ferry, visited England, to report on the teaching of Dentistry in this country.

THE *Dentists' Register* for 1882 has recently been issued. On page 24 the Registrar has set forth, as heretofore, a table showing the numbers and qualifications, with percentage of the total, of persons registered. There are 5,345 registered Dentists, against 5,266 in the *Register* for 1881. There are 722, or 13.51 per cent., with qualifications, and 4,623, or 86.49 per cent., without. The number of Dental Students registered are 121 against 81 in the previous edition. The increase in the number of registered Licentiates in Dental Surgery is R.C.S.Eng., 11, total, 559; R.C.S.Edin., 6, total 21; F.P.S.Glas., 15, total 40; R.C.S.I., 101, total 278.

A NEW feature in this *Register* is the insertion of qualifications in Surgery of the several universities and corporations, and the degrees of the College of Physicians of London.

THE *Medical Register*, also now published for the current year, shows that there are 23,275 registered Medical Practitioners, being an increase of 339 upon the number in 1881.

PROFESSOR LEDEBOUR has determined the quantity of heat necessary to melt zinc, tin, bismuth, and lead by experiment; and has also calculated it from their known specific and latent heats. The two are shown in the following table:—

	Found.	Calculated.
Zinc	62 units.	71 units.
Tin	26 ,,	27 ,,
Bismuth	18 ,,	22 ,,
Lead	14 ,,	16 ,,

He has also examined several alloys, and found that an alloy of 90 per cent. lead and 10 per cent. antimony melted at 240° C., and required but 13·6 units of heat to melt it, while an alloy of tin and antimony in the same proportions melted at 236° C., yet required 28 units of heat to melt it. It will be noticed that the quantity of heat necessary for the fusion of an alloy cannot be calculated when we know this for each constituent, any more than one can tell at what temperature an alloy will melt from a knowledge of the melting-points of its constituents. Of the simple metals lead is the easiest fusible, requiring but half as much heat to melt it as tin does, although its melting-point is nearly 100° higher in temperature.

THE first General Meeting of the Eastern Counties Dental Association will be held in Norwich on the 26th instant.

THE Summer Session of the Edinburgh Dental Hospital and School will begin on May 1st.

DR. R. S. BALL, Astronomer Royal for Ireland, in a recent lecture on a "Glimpse through the Corridors of Time," said the circle described by the moon was gradually increasing, and thus the day was getting longer and longer as the moon was receding farther and farther. If they looked back to earlier periods, the moon must, therefore, have been closer and closer to the earth. The farther they went back, and at one epoch, which he put at about 50,000,000 of years, the moon must have been very close to the earth, and then the day, instead of being 24 hours, would only be three hours long. The closer the moon was to the earth, the more quickly it revolved; and, looking back to that remote period, they had the extraordinary state of things in which the earth was spinning round once in every three hours, and the moon rotating once in three hours also. At that time the earth was really a mass of semi-molten matter; and if the oceans were there at all, they were suspended in vapour round it. The nearer the moon to the earth, the greater was the rise of the tide; and he calculated that, when the moon was so near to the earth, the tides must have been 216 times as great as at the present time.

THE proprietors of Webster's "Royal Red Book" decided for the future to omit certain businesses from their Court Guide, which by favour have been permitted from time to time to appear in that work. This decision included Dentistry. But overtures having been made, the publishers have agreed to insert the names of Licentiates in Dental Surgery, and to omit the unqualified Dentists, unless the insertion of their names be paid for as an advertisement.

INTERCOMMUNICATIONS.

Communications.

Communications have been received from F. Henri Weiss, London; F. W. Bate, London; H. Stocks, Haslengden; G. J. Williams; Hon. Secs. Students' Society Dent. Hosp. London; A. Howarth, Bradford; Spence Bate, Plymouth; S. J. Hutchinson, London; Walter H. Coffin, London; C. J. Wallis, London; Gilbert Walker, London; The Medical Registrar, London; J. T. Browne Mason, Exeter; Harry Rose, London; Morgan Hughes, London; F. J. Pink, London; Wm. Hern, London; James Hardie, Alloa; G. Pedley, London; Stephen Hoole, London; W. F. Thompson, London; W. Bowman Macleod, Edinburgh; J. A. Biggs, Glasgow; J. F. Pink, London; F. Rose, Liverpool; Dr. Reid, Dr. Peddie, Dr. Smith, Edinburgh; T. B. Welch, Philadelphia; Dr. Walker, London; W. Stringfield, Lowestoft; Messrs. Webster and Larkin, London.

Books, &c., Received.

"Journal of British Dental Association;" "Missouri Dental Journal;" "El Progreso Dental;" "L'Odontologie, The Use of Gas as a Workshop Tool;" "Transactions of Odonto-Chirurgical Society;" "The Medical and the Dental Registers;" Items of Interest; "Daily Review;" "Daily News;" "Independent Practitioner;" "Le Progrès Dentaire;" "Exeter and Plymouth Gazette;" "Dental Cosmos;" "New England Journal of Dentistry."

THE
DENTAL RECORD.

Vol. II. MAY 1, 1882. No. 5.

CASE OF INEXPLICABLE ALVEOLAR ABSCESS.

By Frederic Rose, L.D.S.Eng.

On Tuesday, March 7th, I met with a case of alveolar abscess of a very interesting description.

I was stopping a badly decayed right upper second bicuspid with amalgam for a young gentleman, æt. 18, when I noticed a large swelling on the left side of the upper maxilla, bulging into the palate, from the region of the roots of the second molar. The second molar was apparently quite sound, save a minute speck on the centre of the crown; but was very loose. The stumps of the first molar were present, but firm, and no pain was felt either in the stumps of the first molar, or in the apparently sound second molar, on tapping with the handle of a probe, or on pressure. Only the very slightest pain had been felt in that locality anterior to the time of visit; but by no means sufficient to have led the patient to draw my attention to the tooth.

Though the swelling seemed to arise from the second molar, I recommended the removal of the stumps to begin with, acting on the principle which the old quack doctors adopted, that "it would do him no harm if it did him no good" to lose those useless stumps, which probably might be at the bottom of the mischief.

On removal, the stumps proved to have no connection with the disease; so I lanced the swelling, and probed. At last my probe touched bone-substance denuded of periosteum, and, by using some considerable pressure on the probe, I found I was able to move the second molar slightly. I condemned the tooth, in spite of its apparent soundness, which on extraction, exhibited the following curious appearance :—

On the mesial side of the root, and extending round into the fork between the palatine and anterior buccal fang, was an abscess sac about the size of two peas, but without the slightest connection with the pulp through the apical foramina of any of the fangs. I split open the tooth, and found a perfectly healthy pulp, not in the remotest degree connected with the abscess. What was the cause of such an unusual pathological change? There was no history of a blow, and the young man looked perfectly healthy. He might have been of a slightly strumous diathesis, to judge from his singularly clear pink and white complexion; but there was no other indication to warrant my setting struma down as the cause.

Some local irritant, as a fish-bone, or a splinter of a toothpick, or hair of a toothbrush, might have induced the symptoms, and, I think, was a probable cause, seeing how easily some such things might have got gradually wedged down between the stumps of the first molar and the second molar tooth; but I could not detect any such cause, nor could Mr. Thomas Gaddes, to whom I sent the tooth for inspection.

There is one point of interest attaching to this case, which I have purposely reserved till the last. I referred before to an amalgam stopping I had done on the 7th ultimo in the right upper second bicuspid. To revert to that.

On the 10th of March, Mr. W—— called on me again, with considerable swelling on that side. There was no pulp exposure observed when filling the tooth; the dentine was not very sensitive, cold water had no effect, and there had been no pain worth speaking of during the three days since it was filled.

Why should there have been a swelling there? Does this not seem to point to something more than a local irritation in the case of the molar, though a circumscribed abscess is rare from constitutional causes?

A leech to the gum completely restored it to health.

I should be glad to hear the experiences of the readers of the Record on such cases.

THE ELECTRO-MAGNETIC MALLET.

By Frank Comer, D.D.S.

"So you have one of those toys," remarked a professional brother from the other side of the Atlantic, upon seeing an Electro-Magnetic Mallet in my operating case.

"Yes," I replied; "I have two, as you see, but why 'toys'?"

"Oh, I've tried one and given it up. They are very pretty little things to look at, but they work too fast when they do work, and ball-up the gold; and they are never in order when you want them most. The battery, too, requires a great deal of looking after, and is a great nuisance. No; give me my old automatic mallets, which are always ready and need no attention."

"Now, pardon me, my dear friend; but you are all wrong. First, however, I will confess that when I first commenced with the oldest of these two little beauties in 1879, I felt and believed pretty much the same as you do now, but I did not give it up; I stuck to it like a leech, overcoming one difficulty after another, till now I look upon my Electro-Magnetic Mallets just as you do upon your automatics, as being always ready and needing so little attention that that little is cheerfully given in consideration of the very great aid received from them in filling with gold. I am not an extremist, but I know for a fact that when one has fully mastered the Electric he can, not only insert a gold filling in any position in the mouth better—immeasurably better—and with much greater ease to his patient and himself than he could before, but he can also insert a perfect gold plug with comparative ease in some difficult cavities, which, without this valuable little instrument, could not be perfectly filled with gold at all.

"Now, doctor," said I, in concluding our conversation, "if you will spend a day or two with me I think I can prove to your entire satisfaction the truth of what I have just stated." He came and was fully convinced.

Any dentist who has a fair amount of mechanical ingenuity and manipulative skill can succeed with the Electro-Magnetic Mallet, provided that he is blessed with a good stock of patience and perseverance; but without those invaluable virtues, unless he is a genius, he will probably fail. Having purchased a Mallet and Bunsen Battery complete, and having charged the battery and made the connections as per printed instructions (unnecessary to repeat in this article), the chances are about ten to one that, if the instructions have been faithfully followed, the mallet will work admirably and the novice will go into raptures over it. Probably at night he will have very pleasant dreams about his latest acquisition, and the immense advantage it will give him over his professional neighbours, who, poor fellows! are still plodding along in the old groove.

If his office and residence are in the same house, he does not wait to dress next morning, but hurriedly putting on dressing-gown and slippers, he hastens to his operating room just to see that the "little beauty" is all right and in working order, as it was when he retired the night before; but, horror of horrors! it won't click.

"Confound the thing!" ("little beauty" no longer) "what has gone wrong with it? connections all tight; the battery seems to be all right; wish I had kept my ten or twelve pounds instead of investing it in such a worthless toy."

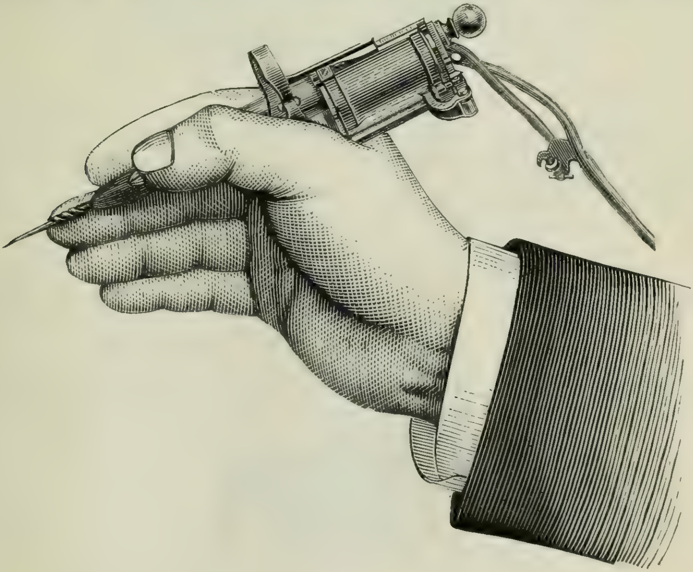
Steady, my friend; have patience; remember this little bit of philosophy by Josh Billings, now and hereafter,—"Young man," says he, "take it easy; you kan't lift a ton at once ef you try, but you ken lift a good menny of 'em fifty pounds at a time."

First, go back and dress yourself; eat your breakfast leisurely, and if you are a smoker, as you probably are, take a quiet pipe while reading your morning paper. Now, go into your operating room, with a clear, cool head, bent upon a careful study of cause and effect. If the battery, connections, and the mallet itself are as they should be, then, when you close the circuit by pressing the slide or key, C, forwards, the armature or mallet, D, will commence to vibrate or click, delivering light blows in rapid succession upon the hard rubber plunger, F, against which the head of the packing instrument rests—Q.E.F. (See fig.). But, if upon pressing the key forward, the instrument does not click, then something is wrong; "why, cert'nly." Yes, but what is wrong. That is the question; so let us try and find out. First, place the tip of your tongue against both of the tubes at the end of the conducting cord, and, in all probability, you will not feel the slightest shock; hence, the trouble is not in the mallet, but either in the battery or conducting cord. To test the battery, disconnect the cord and apply the free ends of the wires—*i.e.*, from the 1st zinc and 4th carbon, to the tongue, when, if no shock is felt, the trouble is in the battery, and the fault is almost sure to be that the zincs are not sufficiently amalgamated, and hence no current is given off.

In an excellent article upon the Electro-Magnetic Mallet in the November 1880 Number of the *Dental Cosmos*, and which all who contemplate having the instrument should read carefully, Dr. M. H. Webb says,—"The whole battery should be kept clean, and the zincs must be well amalgamated, mercury should be added to new zincs each day for the first two or three weeks, and to keep them bright a little mercury ought to be placed upon each one almost every time the battery is recharged." My plan, however, is to place inside each glass jar a short crock (used in England for putting up potted meats), into which I pour about ¼ of an inch of mercury; then set the zinc into the crock before charging the cell with the acids. By this plan the zincs are always thoroughly amalgamated, and require no further attention.

It is now just fifteen months since I first set up my present battery, and during that time hardly a day has passed that I have not used my Electro-Magnetic Mallet from one to three or four hours. About once a month I empty the old acids, cleanse the cells and carbons, brighten the connections, and recharge. I am using the same zincs that I started with, and they certainly look as if they would last another year. On an operation of two or three hours' steady malleting, the current will sometimes become weak, when I simply add a few ounces of pure sulphuric acid to each cell, and then everything is all right. So much for the battery.

The very fine wires in the connecting cord are, even in careful hands, liable to break a short distance back from the tubes, thus breaking the circuit. Usually the break can be felt, but if any doubt exists, place the tip of the tongue (as already described) against both tubes at once, when, if no shock is felt, next place the tongue against the ends of the wires from the 1st zinc and 4th carbon. If a shock is felt, proof positive is established that the wires in the connecting cord are broken. The only place at which I have ever known them to break is just back of the tubes; and if the operator himself does not possess sufficient ingenuity to repair that accident, he had better give the mallet to his best friend in the Profession. If a good current is felt by the tongue at the tubes, and still the mallet will not work, press the armature down to the plunger, keeping the key pressed well forward. If that does not accomplish the desired result, place a very minute drop of oil upon the interrupter at S, and also in the slot in the guide rod. Should the oil fail, then, probably, the best thing to do will be to send the mallet back to the depôt for thorough examination and re-adjustment by a practical mechanic who understands the case, as the fault will probably be found in the intricate arrangement of the connecting wires under the slide or key. An experience of three years' pretty constant use of this valuable instrument has convinced me that the best way to hold it in the majority of operations is not as shown in fig. 1 of the illustrations in Dr. Webb's article (before referred to), for the very good and simple reason that the hand of the operator is too far away from the point



of the packing instrument, and for that reason I usually hold it as shown in the accompanying figure. In this manner the third and fourth fingers of the hand can rest upon the patient's chin, or the teeth adjoining, or opposite the one which is being operated upon, thus steadying the instrument and allowing the operator to do finer work. This may not appear quite clear in a written article, but it will be apparent to anyone who uses the instrument.

The key is, of course, worked by the thumb instead of the first finger; and, for changing the direction of foot-shaped and other points which are not straight, I use my second finger, having, however, previously cut grooves in the packing instrument as shown at O, in the figure, so that the finger will not slip upon it.

Before venturing to use this instrument upon a patient, it will be as well for the beginner to first fill a few cavities in teeth held in a vice attached to the head-rest of his operating chair, and when he does commence to use it upon teeth in the mouth he should do so only in simple fillings. Gradually, as he becomes accustomed to the knack of manipulating it, he will attempt fillings more and more difficult, till, finally, after a few months, or a year or two at most, he will be able to perform with comparative ease operations which he would not have attempted by the old methods.

Let no dentist imagine, however, that the possession of an Electric Mallet will be all that is necessary to enable him to insert perfect gold fillings. He who does not possess sufficient mechanical ingenuity and manipulative ability to insert a good gold filling by hand pressure, or with the aid of an automatic mallet, will never succeed with the Electric; for perfect as it is, it does not possess brains.

In many amalgam fillings, and especially in packing Amalgam around platina pins in the roots of teeth, to which I am about to attach one of my new mineral crowns, I find the Electro-Magnetic Mallet most invaluable.

OPERATIVE DENTAL SURGERY,

Being part of a Course of Lectures delivered at the National Dental College, London,

By W. Finley Thompson, M.D., D.D.S.

I shall now resume the subject of caries in its first stage.

Referring to fig. 3, will be seen the inception of disease on the labial surface of a right central incisor. Here are found several spots,

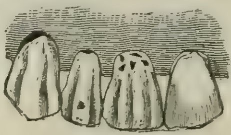


Fig. 3.

which, on examination, show the organ to have lost its osseous integrity. The surrounding tissue may be dense and hard, in which case the small cavities can be filled so as to avoid the appearance of a mass of gold; but the contiguous structure will generally be found soft, with disintegration extending into the proximate surfaces, thus necessitating the removal of such morbid tissue.

The disease sometimes, however, concentrates in one place, as figured in the lateral, instead of forming a collection of spots as in the central, fig. 3, which may not extend much under the gum, but have a tendency to spread in a linear manner, as shown in the canine. This may continue in either direction, until it nearly encircles the tooth; but, should its depth bear any great proportion to the diameter of the organ, the crown may be fractured vertically or transversely. The forms of decay as here presented are frequently signs of approaching senility, the more marked indications being the attenuated condition of the cervical portions of the teeth, accompanied, usually, with retrocession of the gums.

While fig. 1 (page 152) represents a plan of the horizontal or crown surface of the teeth; fig. 4 shows an elevation of the buccal walls, and especially illustrates the advance of decay from its inception, on the second molar, at *a*, to the canine, *b*, *c*, where it may be considered as having reached its third stage. This diagram also shows the position of erosion, which is identical with that of caries proper, and serves to illustrate both, the distinguishing differences having been given in a previous lecture.

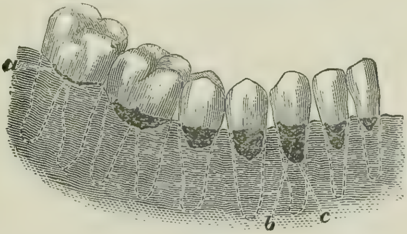


FIG. 4.

The second condition of the disease is now reached, *i.e.*, "An advanced stage of caries with encroachment on the pulp."

The several points of decay, as illustrated in fig. 3, may merge into one cavity, and assume the appearance presented in fig. 5, describing

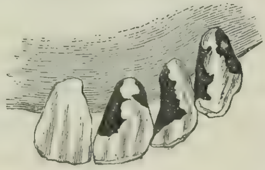


FIG. 5.

the third stage. The inferiority of bulk in the incisors makes this nearly equivalent to the fourth stage.

The second stage is also exemplified in the incisors, Nos. 7, 8, 9, and 10, fig. 1. The pulp here is not yet involved, but is protected by a dark layer of dentine which is the seat of a passive form of decay sometimes presenting a hard and dense appearance.* Examples are frequently seen of the apparent arrest of disease after an extended encroachment in the body of the tooth; the darker and more repulsive its appearance, the more effectually protected seems the organ. This, no doubt, may be attributed to a deposition of earthy matter in the calcigerous cells,—a physical or a physiological phenomenon, which causes the tooth to lose its distinguishing characteristics. The diagram before you (fig. 6) is intended to illustrate the cavities—as shown in fig. 1—filled, and the teeth restored to their original shape.

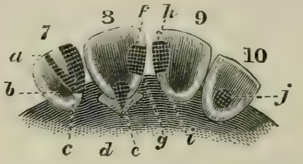


FIG. 6.

In No. 7, of this figure, is represented a filling built upon a right lateral, so as to give the greatest security. Obliquely along the lingual wall will be seen an arm, or extension, which is intended to aid in the support of the filling—the mesial portion of the enamel still existing on the labial wall of the tooth; this is so frail sometimes as to require most careful bracing. At *a* is shown the retention point on the cutting edge, while *b* and *c* indicate the anchorages at the base. In bridging the intermediate portion of the tooth between the extension and the central body of the filling,† it is advisable to cut away 8 m.m., perhaps, of the lingual wall.

The superior centrals, sub-figures 8 and 9, represent the teeth restored to their full contour. The cavities in the mesial region extend antero-posteriorly to the labial wall, and, in their preparation, require to be cut vertically both to the proximate and lingual surfaces, and in a rectangular form, viewed in any of their three dimensions. The location of the anchorages are indicated by the dotted lines pointing from the letters *f*, *g*, *h*, and *i*. On the right central (*e*), decay is seen upon the lingual aspect; this type involves treatment by incision of the gum. Disease, as frequently seen on the lingual wall of the incisors, is represented, after filling, in No. 10, *j*.

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* Especially is this the case when found on the grinding surface of molars.

† This leaves a septum on the tooth intermediate between the two extensions, over which the filling is carried until the whole lingual surface is closed in, extending from the mesial point to that designated at *a*.

The second stage may cover a superficial area of considerable extent, the body of the tooth still being an excellent basis on which to restore with gold. This necessitates work very similar in appearance to that required in the fourth stage; fig. 8 showing an instance which came under my notice.

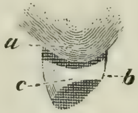

FIG. 8.

a shows the point to which the filling extended under the gum.
c the only remaining portion of enamel left.

Here the disease, without touching the pulp, had spread over the greater portion of the lingual surface of a canine, and under the margin of the gum on the distal surface, to the point indicated by *a*; it had also extended over the major part of the labial aspect, diverging on the cervical border in a meso-distal direction. Of the whole lingual wall of the tooth, it was possible to save only the strip of enamel seen in the figure, which extended from the meso-lingual point to the opposite proximate boundary.

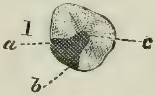

FIG. 9.

In the above, corresponding with the wisdom tooth, No. 1, fig. 1, is exhibited a filling; *a*, *b*, and *c*, showing the points of anchorage.

I have already spoken of the seat of caries, represented in fig. 9, as being in the most difficult position for treatment of any in the mouth; and, in operations of this description, it will be necessary to adopt such measures as may suggest themselves in each individual case.

In preparing the cavity, the anchorages should be formed at the base of the walls radial to the coronal centre, at locations indicated in the diagram. The greatest power of resistance, however, will be obtained by slightly changing the direction of the converging walls; causing them to again diverge before joining with the semi-circular wall of the medial region. At *a* and *b* grooves are formed along the vertical walls, which should be solidly packed with leaf foil, in conjunction with the carrying along of the body of the filling with gold of heavier preparation; the keystone of the work terminating at the dove-tail *c*.

The application of the rubber to these teeth cannot always be made, in which case pads of bibulous paper may be adjusted so as to compress the duct of Steno. In addition to this, a prop may be introduced to distend the jaws in a position not uncomfortable to the patient, yet in such a manner as to give an unobstructed view, if possible, of the parts to be operated upon. The maxillæ cannot be separated beyond a certain limited extent, as, after that degree is exceeded, the buccinator muscle is rigidly contracted upon the molar teeth, causing the mucous membrane to encroach upon territory difficult of access. This, however, is but one of several obstacles to be contended with; for the strong and powerful masseter plays its part with the antagonistic forces in the contest, and adds to the inaccessibility of the third molars by limiting the angular distance through which manipulation can be conducted, and also, in conjunction with the buccinator, coerces the mucous membrane into a position that makes it susceptible to injury. This muscle, however, acts in a somewhat compensating manner as an auxiliary to the use of pads, and assists in temporarily arresting the spontaneous flow of the parotid secretion into this already too circumscribed area in which to operate. In viewing the cavity, it will be seen that it is situate upon the rounded turn of the tooth, also that it is V-shaped, the divergent part being upon the external portion. A hope of the retention of a filling placed in such a locality must exist in measures adopted to secure this end. Too much importance may be attached to the retaining power of the anchorages; these are valuable aids, but they cannot be regarded further than the part they fulfil in steadying the gold during the starting period. Hyperæsthesia usually exists in the wisdom teeth far in excess of that found in the associate dental organs, while the decay, extending in a lineal direction around the cervical portion of the tooth, frequently reveals so much new territory in a state of semi-disintegration, that it involves the mind in doubt as to when and where to discontinue the work of preparation. This has its exceptions, yet being so much the rule, the wisdom teeth are not considered such as to permit any strong hopes being based upon their permanent retention. However, in the absence of the first or second molars, removed in youth, every effort should be made to save them.

I must now call attention to measures required in the second stage.

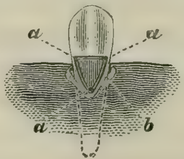

FIG. 10.

The limited intermediate substance between the external surfaces and the pulp restricts the disease to a very circumscribed invasion—where this organ is not encroached upon. Therefore, in the triangular cavity, as in fig. 10, an anchorage is to be made in each angle, as also a minute groove at the base of the surrounding walls. In filling a cavity of this description, commence in the lower anchorage, and continue to build until the gold reaches perhaps an equi-distance from the base to the upper portion of the cavity; then build in each of the remaining anchorages, working towards the centre, at which the different portions of the filling will meet and blend. On the foundation thus obtained, additional gold can be applied until the surface of the tooth is symmetrically followed.

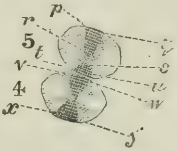

FIG. 11.

In the above—seen as cavities in fig. 1—are shown the bicuspids after having been operated upon.

No. 5, second stage. Filling on ante-proximate surface, at *p*, *q*, extending to medial point. Filling at *t*, *u*, on post-proximate surface; *r* and *s* showing points at which dove-tail steps are to be made—similar in principle to that described in the wisdom teeth—in which anchorages are formed.

No. 4, third stage, represents a more extended condition of decay, restored with gold, the two cavities merging into one, with anchorages at *v*, *w*, *x*, *y*.

In the conduct of operations—first and second stages—you will have an opportunity for practice which will aid you in more difficult cases, as those in the third and fourth stages, to a consideration of which we are now approaching.

The third stage I have defined as "A condition of disease involving partial or complete exposure of the pulp, without necessary loss of the same."

The exposure of the pulp implies a series of complications which may extend over an area quite unexpected, and calls not only for skilful treatment, but a full recognition of the therapeutic as well as prosthetic measures to be adopted.

That the study of every stage of caries should be as exhaustive as possible is rendered evident by the fact that, in actual practice, it is, at this period, developed in some one tooth, that the ordinary patient presents himself for treatment. But, when the magnitude of the operation becomes evident, and examination shows the existence of caries of the first and second stages, one or both of the following causes may stand as an opposing influence to a successful course of treatment, *i.e.*, idiosyncracy or mental reservation—the last of which may be antipathy, prejudice, or indifference.

To comprehensively present the following case in connection with its relationship to the third stage, I shall be compelled to introduce several diagrams. Referring to fig. 1, No. 2, will be seen the right superior second molar, which is decayed upon its ante- and post-proximate aspects Fig. 12 illustrates in plan the preparation of the crown cavities; the anchorages, grooves and steps of which are more clearly delineated in figs. 13 and 14.

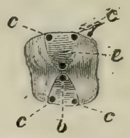

FIG. 12.

The above cut represents a second molar in the third stage.

b. Anchorage in the septum—medial region.

c c c c. Anchorages on the ante- and post-proximate boundaries of cavities.

e. Pointing to exposure of pulp, which is further illustrated in cuts 13 and 14.

During the preparation of the ante-proximate cavity, it is discovered that the cornu of the pulp, below the ante-lingual-medial point, has become exposed by the intersection of the curved surface of the floor of the cavity, as is represented at *e*, figs. 12, 13, and 14. Capping, as a diasostic measure, is indicated, but the treatment will necessarily vary with the extent to which inflammatory irritation may have been induced. The exposure involves but a small area, and may be effectually sealed from external influences by the use of thick carbolized paper, which from its pliancy is readily adapted to the interstices in the floor of the cavity, without becoming inimical to the

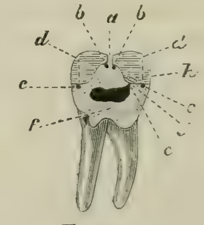

FIG. 13.

Tooth split between the lingual and buccal fangs to show the third stage of disease.

a. Parietes extending from the grinding surface of the enamel to the more solid body of dentine covering the pulp chamber.

b b. Anchorages in the medial region.

c c. Anchorages in the post- and ante-proximate regions.

d d. Terminations of the grooves under the enamel.

e. Point of exposure of the pulp.

f. Fractured surface.

g. Carbolized paper capping the pulp.

h. Oxychloride of zinc, interposed as a non-conductor to thermal change.

normal condition of the pulp. The ovoidal end of the handle of an excavator can, in the absence of a special instrument, be used to make an indentation in the paper sufficient to arch over this minute exposure; while the paper should be accurately adapted to the concavity so formed, and gently placed in its position. To re-duplicate the paper would be to give too great a proportion of a yielding substance in the restoration; therefore, oxychloride of zinc should be placed above the paper capsule, as a further protection from thermal change.

The subject under consideration cannot be too well understood: and, for this reason, I shall endeavour to give a detailed description of the dangers which encompass the attempt at preservation of an exposed pulp. The repeated excitation of this organ, or continued irritation for any length of time, materially augments the morbid tendencies. Commencing with local irritation, following with congestion, and terminating in suppuration; it ultimately extends to adjacent tissues, when the disease can no longer be considered local, but systemic, and must be treated as such. The cornu, not being in any particular plane, curves concentrically with the surfaces of the teeth. The following illustration is intended to more clearly reveal the position as shown in fig. 14.

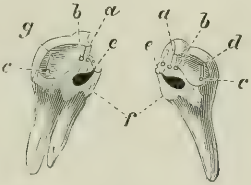

FIG. 14.

Perspective view of the last figure.

a. Walls between cavities. *b b, c c.* Anchorages. *d.* Groove. *e e.* Point of exposure. *f.* Fracture. *g.* Prepared cavity.

The difficulty presented in this instance does not, however, express the degree to which, by complication, even the initial exposure of the pulp may be aggravated. In the case before us, the cornu has been intersected at a point; but, should the area of disease assume a parallelism with the superficies of the pulp chamber, a single stroke of the excavator may remove the osseous covering and reveal a projecting angle, or, further, a portion of the parietes may be destroyed, causing an exposure of a very appreciable length and breadth. Such an occurrence is sometimes associated with the accidental penetration of the pulp, and must be met by the adoption of methods of obtunding pain commensurate with the gravity of the occasion. The increased vascularity of the pulp where the floor of the cavity is porous, causes actual hemorrhage to occur before the pulp is impinged upon. Should, however, there be no firm basis reached, it will be proper to leave a thin capsule, even of this imperfect material, over the pulp, as its exposure is always to be considered a disaster, and to be avoided. In preparing the cavity, increase the circumferential area in which to cut a rudimentary groove around the fractured surface. A metal cap can then be adjusted in conformity to the shape of this groove, its concavity being such as not to touch the pulp. Oxychloride of zinc will now fix the cap in position, and also act as a non-conductor; but the anchorages and grooves, on the principles enunciated, will have to be made at points independent of the floor of the cavity. In capping, the preservation of the pulp cannot always be hoped for; the practice, however, has met with success that justifies its adoption, and I need hardly add that it is a distinguishing feature in conservative treatment. The pulp devitalised, a legacy of weakness is left to the tooth; discolouration ensues, and this portion of the economy as it dies so involves its ally—the peridental membrane—as to threaten its destruction. Commencing with passive congestion, it runs through the different stages of disease, until the general system is incited to rebel against the inanimate cause of such discord, even to ultimate rejection and expulsion.

If the pulp can be protected from contact with external influences, the formation of secondary dentine, though problematical, is greatly favoured. When the pulp chamber has been but recently invaded, it is not unreasonable to suppose that treatment by capping will be successful; with an extension of time, however, the case becomes more aggravated, owing to atmospheric and mechanical action upon the pulp.

Opinions are much at variance as to the benefits derived from different materials used for capping; for, as all remedies are valuable only from their appropriate use, experience of their applicability is required to ascertain the circumstances in which they are truly of service. The means of capping, in all cases of recent exposure, are directed with a view of restoring the pulp to a normal functional condition. Previous, however, to such treatment being adopted, it is necessary, if pain exist, to subdue the paroxysms by mild but active measures. Any tendency to pulpitis must be aborted, and a quiescent state induced, before recourse can be had to capping.

The treatment entirely depends upon the circumstances of the case, anodynes being indicated, but they should not be employed indiscriminately or without investigation as to the existing pathological condition; this, however, leads us into therapeutics, and will be more particularly dwelt upon at another time.

Reverting to fig. 4, the progress of caries in the vicinity of the gum conveys an impression that it is even more insidious than that which commences on the crown surface. In the cervico-buccal region, especially in the molars, it is sometimes hidden by the festooned edge of the gum, which nearly coincides with it in shape. No section has hitherto been necessary to represent the encroachment of disease in fig. 4; but, to show the extent, or rather depth of the caries, a transverse section has been made. Teeth split between the fangs, instead of the usual section, exactly fulfil the requirements of the case, and enable me to more clearly depict the encroachment of disease on the pulp. In a lower molar, we are able to trace the third stage; commencing at, or near the gum, decay has extended into the body of the tooth both laterally and vertically, until the pulp chamber is penetrated—*vide* fig. 15, split section of a lower molar.

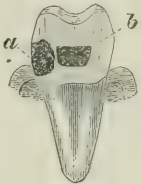

FIG. 15.

a. Caries extending below the gum, and touching the pulp chamber.
b. Pulp chamber (section between fangs).

I wish now to direct attention to the fourth stage, viz.: "A broken down condition of the tooth structure, complicated with pulpitis and death of the pulp."

This stage involves some of the most interesting examples of restoration, and has drawn largely on the resources of the dental art.

Not only are these cases complicated in character, but they vary in almost every instance, and require a special adaptation of means at the hands of the dentist. Gold, excellent as it is as a filling material, does not adhere to the sides of a cavity, but remains mechanically fixed therein, by being forcibly packed against the surrounding walls. But when the substance of the tooth is wasted, the foundation becomes insecure, and the filling must, therefore, be fixed to its position by means independent of adjacent lateral support; otherwise, the slightest shock in masticating may result in disaster to the work. Between an extreme condition of instability, and the almost certain fixity attainable in solid walls, various degrees of conflicting difficulties are sure to be present; however, by a judicious appropriation of that portion of the tooth that can be saved, and the use of differently constructed appliances for retention —inserted in the solid dentine—a substitute for the lost tissue may be obtained. These extra attachments, or retaining appliances, are especially demanded in the designated fourth stage.

Figure 15 illustrates a condition, the continuation of which is further shown in the following representation of extensive decay.

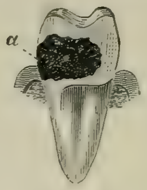

FIG. 16.

At *a* is seen caries extending into the pulp chamber and below the gum, threatening the bridge between the fangs, and leaving the crown supported on the lingual and proximate parietes of the tooth.

In the above may be seen an exemplification of caries which has destroyed the parietes, and spread itself in every direction, until the crown is undermined and left with no other support than perhaps a portion of its lingual or buccal sides, and portions only of the proximate surfaces. In treating a case similar to the above, it will be imperative to remove that portion of the crown which is situated immediately over the diseased part of the tooth, as otherwise the pulp chamber, and its divergent extensions, might prove abortive of every attempt to insinuate instruments of the most pliant and filamentary character.

The elevation of this tooth (fig. 17), showing the prepared cavity, illustrates very plainly the anchorages and grooves, and also the position of a step made in the medial region. On the floor will be seen the entrance to the root canals at the point at which they become confluent in the lower part of the pulp chamber. The plan, fig. 18, gives still more clearly the position of the intersection of the united canals by the floor of the cavity.

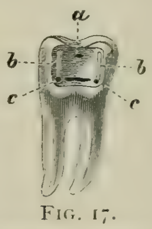

FIG. 17.

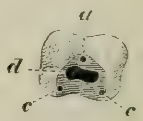

FIG. 18.

The above cuts represent a lower molar prepared for filling, fourth stage, in which decay originally commenced at the gum. See fig. 16.

a. Anchorage in medial region on a step made in the angle of the V-shaped part of the cavity; the step being about 1-6 m.m. below the crown enamel surface.

b b. Grooves cut from under the enamel extending to anchorages *c c*.

c c. Anchorages on floor of cavity near buccal edge of same.

d. Pulp chamber.

I have exhibited to you the formation of cavities from the earliest inception of decay, passing through the different stages; also selected instances from figs. 16 and 21, sufficient to show methods adapted to the various stages of disease. Some have been simple, others difficult, calling for the greatest manual skill in their execution. But I shall now describe cases of an exceptional character, that require an originality of thought and action quite independent of any teaching or prescribed rules which might govern you in ordinary practice. You will have no precedent, nor will the text books aid you further than with suggestions in a general way. The treatment carried to a successful issue, however, will result in the establishment of confidence, leading to a position which might not be attained through any other medium.

In my next lecture I shall endeavour to show wherein the gold may not only supply tooth deficiency, but, by a system of bracing, enable the frail portions remaining to be protected from shock and consequent fracture, as well as from contact with the fluids of the mouth, or other and deteriorating influences.

The cases now under consideration are peculiarly trying to those compelled to submit to treatment, the imperative nature of which must necessarily involve mental and physical endurance, difficult to be understood previous to the operation. The obvious duty of the dentist, under such circumstances, is, 1st, to ascertain the predisposing influences which may combine to oppose him in the measures marked out for his adoption; and, 2nd, to make a full and comprehensive statement of the difficulties attendant upon the operation, in order that it may not result in confusion to himself and distrust to his patient. The choice and application of the means must be suggested at the time of operating; for it is impossible to lay down any prescribed rules or measures to be adopted, owing to the many unforeseen and conflicting contingencies that may arise. This must come from experience or intuition, or, perhaps, a combination of both, which makes the practitioner master of his position.

INFLUENCE OF HEAT ON ZINC.

When rolled zinc is heated to a high temperature (says Herr Kalischer, in a recent paper to the Berlin Chemical Society) it undergoes a number of constant changes, without the external aspect becoming immediately different. It loses its clear ring and becomes nearly mute, like lead; it can be more easily bent, but is also more easily broken, and in bending makes a noise almost exactly like the "cry" of tin. All these changes are due to the zinc being altered in molecular structure under the influence of heat—becoming, in fact, crystalline. This crystallisation is easily rendered visible if a strip of zinc, after being heated, is dipped in a solution of sulphate of copper. The action is instantaneous; one has merely to dip the zinc about half a minute in a concentrated solution, then wash off the copper precipitated on it, to obtain distinct indication of crystallisation on the surface.

That this is not a mere surface action appears from the fact that rolled zinc, after being heated, proves to be crystalline on fracture, and however small the extent to which it is corroded by the sulphate of copper solution, it retains its crystalline structure. The mode of cooling has here no marked influence; whether the zinc is slowly cooled or chilled by being plunged hot into the cold solution, the result is always the same, and I have often obtained this action with zinc-plate of only 1-20mm. to over 5mm. thickness (*i.e.*, about 1-500in. to 1-5in.). I had no thicker plates. Whether foreign admixtures of zinc have an influence I am not in a position to say, as I had not an opportunity of trying different kinds of zinc. The kind I used is Silesian.

To determine approximately the temperature at which the change to the crystalline state occurs, I heated the zinc strips in an air-bath, and took them out whenever a given temperature was reached. The results obtained thus were not always quite uniform. In any case the zinc must be heated over 150° C. to afford distinct signs of crystallisation on corrosion. Sometimes I have only got such signs on heating to 170°; but crystallisation was often evident between 150° and 160°, and beyond that it becomes even more distinct, and continues to the temperature of fusion. But previously to the proof of crystallisation by corrosion, one finds proof in the "cry," which is perceived, as a rule, when heating has proceeded to about 130°. The higher the temperature, the stronger is the "cry," and the duller the "clang." The crystalline character, further, is apparently dependent on the temperature to which the zinc has been heated. In general, at temperatures under 300°, it appears like ice-flowers, or moire, whereas, at a higher temperature, the crystals are more sharply formed and individualised.

The observation here communicated is not only interesting itself, as an instance of a direct and rapid change of the molecular structure of a metal through heat, but also, inasmuch as "crying" zinc takes place by the side of another metal behaving similarly, and the supposition that the "cry" of tin is the result of a crystalline structure, finds a new confirmation in the behaviour of zinc. As the entire process for demonstrating crystallisation does not take more than a minute, this makes a suitable lecture experiment for illustrating the influence of heat on the molecular structure of a solid body.

Perhaps it is not superfluous to point out that the observation in question may possibly be not without significance for technical work; for, since the tenacity of rolled zinc is diminished with the change to the crystalline state, and this change is produced by heating, it may be important in rolling, to see that the temperature does not become too high. And as the "cry" is undoubtedly an indication of beginning crystallisation, and, as a rule, is perceived after heating to 130°, it will be well to keep the temperature under 130°. It will also be possible to find an indication of the state of tenacity by examining whether the zinc "cries" or not. Of course, the question still remains open, whether the mechanical action of rolling does not, in *all circumstances,* prevent the occurrence or the continuance of a crystalline structure.

It was probable that the change of the molecular structure of zinc would affect other physical properties of the metal, and Herr Kalischer first compared the specific gravity of zinc that had been heated to 320° to 330°, and then cooled. With that of ordinary rolled zinc, four determinations were made, and with the remarkable result of a slight increase of density in the zinc rendered crystalline by heat. The ratio of the specific gravity of zinc in the crystalline, to that in the ordinary state :=1·0004 : 1, or an increase of the former about 4-100th per cent.

Next, the author, after satisfying himself that zinc wire also becomes and continues crystalline through heat, compared the electric resistance of wire 0.48mm. in diameter, in this state, with that of the same wire in the ordinary state. The limit of temperature was here 300°. The ratio of resistance of the ordinary to the crystalline wire was found on an average to be = 1-0302 1 : , showing a decrease of the latter about 3 per cent. The change of volume through heating must here have been inconsiderable. Herr Kalischer draws attention, however, to the fact that the separate results in the series of experiments are too divergent, and he attributes this to the great extensibility of zinc wire.

Some other physical properties of zinc rendered crystalline through heat the author hopes shortly to investigate.

"More important," he proceeds, "is the question, whether other metals show a behaviour similar to that of zinc. I have, therefore, examined, from this point of view, plates of copper, brass, iron, and aluminium, but without being able to demonstrate crystallisation. I do not, however, regard this matter as closed; the less so, that in the case of iron, when heated to a red glow, there appear to be some traces of crystallisation; and that rolled copper, when heated to an initial red glow or more, always loses its ring, like zinc. Copper, it is known, becomes soft through heating; but the loss of the 'clang' cannot be attributed to this, for brass or aluminium also become soft through heating, and yet their 'clang' continues unaltered. Thus the view gains, probably, that copper also may behave similarly to zinc, and perhaps I have merely not yet found the right corrosive liquid for proving the crystallisation in copper. The use of dilute acids gave a negative result. For the rest, it would not be very surprising if other metals were not easily found, which present the phenomenon described in the case of zinc, as this metal is known to have an extraordinary tendency to crystallise in solidifying. The case may be conceived to be, that zinc loses, in rolling, the crystalline structure which it acquires in solidifying; and, if it be heated to a temperature exceeding that which it obtains in rolling, it gets back the crystalline structure. Cadmium offers the greatest likelihood of a behaviour similar to that of zinc."

What led Herr Kalischer into this investigation was the observation that when a zinc strip, coated with graphite on one side, was immersed in sulphate of copper solution, and the precipitated copper was afterwards washed off, the metallic surface was become crystalline. Thinking, first, it was a galvanic phenomenon, he said to himself, that in that case, the more convenient lampblack must have the same action. The result corresponded to expectation; and having blackened the zinc on one side in a flame, and written in the lampblack, he obtained the writing in crystalline form by means of the sulphate of copper solution. It was only after he observed the loss of "clang," and the "cry" of zinc, that he came to be of opinion that heat was the cause of this phenomenon, as he remembered that for attachment of the graphite he had covered the zinc with shellac solution, and passed it several times through the flame to get the right consistency. That the lampblack had no influence, he convinced himself, on applying it as cold as possible, the zinc being held at a distance over burning camphor. There was then no trace of crystallisation.—*English Mechanic.*

INCIDENTS IN PRACTICE.

At a recent meeting of the New York Odontological Society, which is reported in the *Dental Cosmos*, Dr. Dwinelle said: I have to report a failure. To-day a lady came to me, for whom a year ago I filled a large number of teeth. Her teeth were exceedingly sensitive to inhalation of air, and to cold water also. I treated them in the method I have reported several times before this Society, with chloride of zinc, applying it with a heated instrument. This treatment has been very successful in nearly all cases. She came to me recently, however, with one tooth that had given her much trouble. It was a superior twelfth-year molar, on the left side, having a cavity in the posterior approximal surface. It was exceedingly sensitive, and ached so frightfully that I could hardly do anything with her. The tooth resisted treatment so long that I came to the conclusion I would destroy the pulp, and was not opposed. It was either that or remove the tooth. I destroyed the pulp, removed it, medicated the pulp-canals, let the tooth remain for several days, and then filled the canals to their extremities. The tooth had three roots, though they were nearly united in one. She came to me early this morning suffering beyond expression. I made a series of external applications, but with no effect. I finally treated with chloroform. This afternoon she came back, and I must confess that in all my practice I never witnessed such exquisitive and excruciating suffering. She entreated me to remove the tooth. I did so, though against my wish. I found these aggregated roots cemented together so that I could hardly trace the outlines which would express the treble form. I cut the tooth open, and found that I had filled the roots perfectly to the foramina. I expected to find the pericementum inflamed and highly coloured. To my surprise it was pale and bloodless. I must confess it is a puzzle to me. I believe I have had as much experience as almost any one in the last forty-odd years in treating teeth, and I must confess that the cause of this pain is unaccountable.

Dr. Rich: I have no doubt that in many cases of that kind, if the socket were examined carefully, small spicules of bone would be found protruding from the walls. I will describe one or two of the cases of that kind that have occurred in my practice. The subject of one of them was the daughter of an eminent physician of this city. Her teeth had been continuously under my care from her childhood. She grew up a fine, healthy, robust girl, with large, regular, fine teeth, which she kept in good order and was very proud of. When she was about twenty years of age she complained of an occasional severe pain in the right superior first molar. She consulted me about the trouble the tooth was giving her, and I made a careful and thorough examination of the offending member, but could not discover any cause for the pain she was suffering. The tooth was perfectly sound, not a speck of decay about it, and not at all sore to pressure or percussion. The application of a current of electricity gave no indications of a dead pulp. The intervals between the periods of suffering became shorter, and within six months after its first appearance it became continuous, and the torture from it was almost unbearable. She could not sleep except when under the influence of narcotics, became extremely nervous and irritable, and the derangement of the system became general. She lost her appetite, and ran down in health and flesh very rapidly, and her condition became a source of great anxiety to her family. During all this time she was under the care of her father, a most a skilful physician, who tried every means available to relieve her and enable me to save the tooth. The symptoms were something like those that occur when there are osseous formations going on in the pulp, and with the idea that possibly that might be the cause of suffering, I destroyed and extirpated the pulp ; no such formations were found in it, and no relief followed the removal of the pulp. I then extracted the tooth. The pain and nervous irritation immediately disappeared, and the patient rapidly recovered her health and good looks. When I looked at the tooth after taking it out, I found a part of the ruptured membrane was still attached to the palatal root; upon examining this under the microscope I discovered three points of inflammation in different parts of the membrane that remained on the root, about the twentieth of an inch in diameter. With this exception the membrane had the appearance of being strong and healthy, and except in these spots was entirely free from inflammation. From some previous experiences these spots of inflammation, and the general character of the case, suggested spicules in the socket. The day after the tooth was extracted I made a very careful examination of the socket, and found not only the three that corresponded with the points of inflammation discovered with the microscope, but a number of other small spicules in that and the sockets of the other roots. A few months after the extraction of the tooth I have just mentioned, the same symptoms were developed in the first superior molar of the left side. In the case of this tooth, as soon as the symptoms were well ascertained to be identical with those attending the commencement of her suffering, the tooth was extracted, as the patient would not undergo a repetition of the torture experienced with the first one. And by this process this young lady has lost four of her upper molars during the past five years, the first and second molars on each side. As yet none of the other teeth have been affected in that way.

Dr. Rich also reported : I had a case in my practice to-day that is a good illustration of the advantages of my mode of using nitrous oxide when working upon sensitive dentine. The patient was a lady of very decided will, and altogether a very irritable and disagreeable person to deal with when anything goes wrong with her, and to-day things did go wrong, for she came to me to have a tooth filled, and it proved to be very sensitive. At the first indication of pain she stopped me and she would not have anything more done to it if it was going to hurt in that way. I then proposed to use some nitrous oxide ; she consented, and in doing so declared she would not suffer pain, but would rather lose the tooth ; but if I could fill it without her being obliged to suffer as she had done, she did not care what I used. I gave her some nitrous oxide, and the cavity was excavated without any trouble, and she did not make the least movement while I was doing it, but when I had finished forming the cavity and told her so, she remarked in reply, "Well, that is what I call fun!" I only filled the bag once, and it holds about four gallons. The cavity was a large one in the distal surface of the right superior second bicuspid, extending under the gum. She took three inhalations the first time, which took all the pain away; when the pain returned she took two more inhalations, and I was able to cut away the bone as rapidly as I wished. When I was about half done she asked for more and I gave her the second dose, and before I completed the excavating, I gave her two doses more of two inhalations each. It is not necessary to make the patient unconscious. This is one of the cases that are occurring in my practice all the time, and to my patients they are very satisfactory experiences. The gas is inhaled through the mouth; I apply the rubber dam before I give the nitrous oxide, and I can always arrange it so that it will not be in the way.

ETIOLOGY OF TUBERCULAR DISEASE.

The Etiology of Tubercular Disease was the subject of a paper read by Dr. Koch, before the Physiological Society of Berlin, on the 24th of March. He states that one-seventh of the deaths of the human race are due to tubercular disease, while fully one-third of those who die in active middle age are carried off by the same cause. He subjected the diseased organs of a great number of men and animals to microscopic examination, and found, in all cases, the tubercles infested with a minute, rod-shaped parasite, which, by means of a special dye, he differentiated from the surrounding tissue—in the centre of the tubercle was the minute organism which had created it. Transferring directly, by inoculation, the tuberculous matter from diseased animals to healthy ones, he in every instance reproduced the disease. He also cultivated these *bacilli* artificially, for long periods of time, and through many successive generations. At the end of the process, which sometimes embraced successive cultivations extending over half a year, the purified *bacilli* were introduced into the circulation of healthy animals of various kinds. In every case inoculation was followed by the reproduction and spread of the parasite, and the generation of the original disease. Of six guinea-pigs, all in good health, four were inoculated with *bacilli* derived originally from a human lung, which, in fifty-four days, had produced five successive generations. Two of the six animals were not infected. In every one of the infected cases the guinea-pig sickened and lost flesh. After thirty-two days one of them died, and after thirty-five days the remaining five were killed and examined. In the guinea-pig that died, and in the three remaining infected ones, strongly pronounced tubercular disease had set in. Spleen, liver, and lungs were found filled with tubercles; while in the two uninfected animals no trace of the disease was observed. In a second experiment six out of eight guinea-pigs were inoculated with cultivated *bacilli*, derived originally from the tuberculous lung of a monkey, bred and rebred for ninety-five days, until eight generations had been produced. Every one of these animals was attacked, while the two uninfected guinea-pigs remained perfectly healthy. Similar experiments were made with cats, rabbits, rats, mice, and other animals, and, without exception, it was found that the injection of the parasite into the animal system was followed by decided, and in most cases virulent, tubercular disease. In a vast number of cases Koch has examined the matter expectorated from the lungs of persons affected with phthisis, and found in it swarms of *bacilli;* while in matter expectorated from the lungs of persons not thus afflicted, he has never found the organism. The expectorated matter in the former cases was highly infective, nor did drying destroy its virulence; hence the grave danger of inhaling air in which particles of the dried sputa of consumptive patients mingle with dust of other kinds, again placing beyond doubt the communicable nature of the disease. The researches of Prof. Koch, by means of vivisection, have established the fundamental identity of tuberculosis with the class of diseases for which inoculation is a prophylactic, as shown by the discoveries of Jenner and Pasteur.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The Monthly Meeting was held at 40, Leicester Square, on Monday, April the 3rd, S. Lee Rymer, Esq., President, in the chair.

Mr. G. Hockley showed, on behalf of Mr. Hockley, of Gravesend, a second right upper molar united to the wisdom tooth. The patient, aged 30, had suffered from neuralgic pains which were worse during pregnancy, and on extracting the second molar, which was effected without difficulty, the wisdom tooth came with it.

Mr. Ackory presented to the museum a specimen of unilateral syphilitic deformity of the central and lateral incisors which he had shown at a previous meeting, and which had since been mounted by Mr. W. Weiss. He believed such cases to be very rare.

Mr. Coleman said he had seen several cases of that kind, but he had not taken impressions of them. He exhibited a model showing two supernumerary incisors of distinctly syphilitic type, whilst the proper centrals were well formed but within the dental arch. The patient presented other distinct evidences of syphilitic taint. The supernumerary teeth had been removed. He also showed a model of the upper jaw of another patient who had two supernumerary teeth in the central incisor region. The left central was in front of the lateral, and the right central, which had not yet come down, could be felt in the same situation. The left supernumerary tooth had been extracted, and the proper central transplanted into its alveolus. The same course would, at a future time, be pursued on the right side. The patient was shown.

Mr. GURNELL HAMMOND exhibited a baboon's tooth, which he had recently extracted at the Zoological Gardens. It was the first right upper molar. Mr. Hammond had great difficulty in forcing up the instrument and extracting the tooth on account of the great thickness and hardness of the alveolus. Having extracted the tooth he tried to perforate the antrum through the alveolus, but could not succeed in doing so ; he, therefore, perforated the anterior wall with a trochar, and about two drachms of pus escaped. The animal was at once relieved by the operation, and had got on very well since. He split open the tooth and found the pulp dead. Chloroform was given, but it was with difficulty that the animal could be got sufficiently under its influence.

The SECRETARY read a communication from Mr. Edwin Cox, L.D.S.Eng., of Auckland, New Zealand, but formerly of Preston, Lancashire, giving the history of a case of cancer affecting the right superior maxilla, which commenced with a discharge of thin fluid from the region of the second molar, but which had not any offensive odour. The patient was a strong man, aged 44 years. After the use of a lotion, and other treatment, Mr. Cox removed the second molar, and the patient afterwards thought that at times the discharge had ceased ; but it eventually increased, and caused Mr. Cox some anxiety. The patient consulted a surgeon, and afterwards Mr. Christopher Heath, who pronounced it a case of cancer. The suffering became intense, and the patient died in 1878.

Mr. GADDES read a paper on "The Limitation of Dental Surgery," of which the following is an abstract :—This paper deals with certain facts of experience, embodies questions as to the proper lines of treatment adopted, and solicits the opinions of members of the Society as to the course pursued being within the recognised limits of Dental Surgery.

A girl, aged 16 years, was sent by a general practitioner to the National Dental Hospital for advice respecting an abscess-like growth, which bled frequently and was in connection with the buccal aspect of the first upper right molar. Mr. Henry Weiss saw the patient, and determined, under the influence of nitrous oxide, to remove the tooth, and what he readily diagnosed as a tumour, together with the outer plate of the alveolus. The effect of the anæsthetic too quickly passed off, and only the tooth and bulk of the growth could be removed. The next day the patient again appeared; there had been some pain and hæmorrhage from the wound, the girl was anæmic, and large granulations filled up the space recently occupied by the molar tooth. A microscopic examination of the growth, which was about the size of a bean, showed it to be a round celled sarcoma, and very vascular. It was attached to the periosteum of the two buccal roots of the tooth, but was quite free from the palatine root.

Before interfering further surgically, it was thought better to improve the patient's low and anæmic condition by the administration of a tonic and hæmatinic, and a note to that effect was sent to the general practitioner. After three days the patient's appearance was slightly improved, but the tumour was considerably increased in size, and came in contact with the lower tooth on occlusion. Nitrous oxide and ether were administered, and Mr. Gaddes removed the whole of the remaining outer alveolar plate with the hyperplasia. On the following and subsequent days the granulating surfaces were cauterised with nitric acid, and also, at other times, with caustic potash, so as to check their excessive growth by, if possible, retarding the proliferation of the embryonic elements, and favouring the elaboration of a more mature fibrous tissue. Though the application of those agents destroyed an amount of tissue, yet the tumour recurred with considerable rapidity, and with occasional hæmorrhage, and by the end of a fortnight it was clear that enough had not been removed. Desiring to be as conservative as possible, and to retain the second bicuspid in front, and the second molar behind, gas and ether were again given, and the whole of the socket and gum tissue around, to nearly the periosteum of the floor of the antrum, were gouged out. This had the desired effect. Some rapidly growing granulations were touched with caustic potash; periostitis of the second molar was relieved by opium fomentations, and the parts were kept clean by a solution of permangate of potash. Some four months after the operation the wound was quite healed, and there was no indication of so much of the bone having been removed.

This case clearly shows the importance of the oft-repeated necessity of a complete removal of all tissue invaded with the embryonic cell elements of the most recurrent form of the sarcomatous tumours. But while the significance of that injunction is fully recognised, we should not lose sight of possible error in the opposite direction, and, by a too heroic treatment, make undue sacrifices even to irreparable deformity.

Apart from the surgical aspect of the case, Mr. Gaddes asked: "Was the last-mentioned operation within the limits of Dental Surgery as recognised in the United Kingdom?" His own view of the circumstances was, that, assuming the propriety of a Dental Surgeon removing at one operation a tooth and the entire socket of that tooth, there could scarcely be established any valid question of professional locus if at one time the tooth were extracted, and at another the diseased socket of that tooth removed. The border line between General Surgery and Dental Surgery is at present ill-defined. Before such a limitation can be fixed, or correctly understood, they must first determine the scope of the specialty as may be practised by the Licentiate in Dental Surgery. The text-books do not afford any guide, for while they, in varying degree, deal with affections of parts allied more or less to the teeth, there is rarely set forth that a certain disease comes within the scope of the general surgeon or practitioner, rather than belongs to the sphere of Dental Surgery. An example of that is to be found in diseases of the antrum, which may arise independently of, and be in no way connected with the teeth, yet they are all treated with about equal attention. The same may be said of tumours of the gums, and of ulceration of the gums, &c.

Recognising the desirability of maintaining a close and friendly relationship with General Surgery, Mr. Gaddes would respectfully suggest that this Society might, with much utility, intimate the limits of Dental Surgery. Such an expression would be of great value as a rule of guidance to the majority of members, and, perhaps, protect them, and by them the Dental Profession, against liability to overstep the boundary of the specialty.

The PRESIDENT said the question raised by Mr. Gaddes was one of great importance, and he trusted that a good discussion would ensue.

Mr. HUTCHINSON asked the President whether an ethical question such as this was a proper one for the Society to discuss. He had always understood that their discussions were to be limited to scientific questions.

The PRESIDENT said he saw no reason why the Society should not discuss the questions put forward by Mr. Gaddes, if it were so minded; indeed, he knew of no other body which was better qualified to do so.

Mr. F. HENRI WEISS said that a similar question had been raised in the discussion of a paper read last year by Mr. Stocken; when the right of dental practitioners to prescribe was called in question, and their late President gave it as his opinion that so long as there was any prospect of saving a tooth, dental practitioners were justified in using any means, constitutional or local, to that end. In this case, however, it was not a matter of saving the tooth with which the disease was connected, for its extraction alone would have done no good to the patient. The case looked, at first sight, a very simple one, and it was only after the first operation that they found they had to deal with a more serious matter. He was not prepared to say that had they at first known the exact nature of the case they would have acted as they had done. No doubt, had things gone wrong with the patient, they might have found themselves in a position of difficulty. The object of the paper was, however, not so much to inquire whether they acted rightly or wrongly in treating the case as they had done, as to ascertain whether any decision could be arrived at as to what should be considered the limits of Dental Surgery.

Mr. S. J. **Hutchinson** thought the admission of Mr. Weiss--that had anything gone wrong with the patient, those who took charge of her might have found themselves in difficulties—was very much to the point. He was himself an M.R.C.S., but, practising simply as a Dental Surgeon, he always referred such cases to a general surgeon or a general hospital ; they might need medical treatment, bandaging, or visiting at their own homes, and these were duties which he was not prepared to undertake.

Mr. **Stocken** thought that the duties of a Dental Surgeon did not necessarily end when the tooth was extracted ; for instance, he was not unfrequently called upon to arrest hæmorrhage. He thought it might be said that so long as the disease to be treated arose from a tooth the Dental Surgeon was justified in treating it either constitutionally or locally. It might be urged that some of those now in the Profession were scarcely competent for such extended duties, but the province of the Dental Surgeon should not be curtailed on that account. What was required was that Dental practitioners should be educated up to their proper station ; in fact, he thought that it would become a question whether the science of Dental Surgery should not be developed in that direction. Mr. Stocken then referred to the case of a medical practitioner who had been suffering for some time from facial paralysis. Mr. Stocken found he had a diseased upper molar, and suggested that this might be the cause of the paralysis. The patient said he had never thought of it ; and on being shown a case of the sort mentioned in Mr. Salter's book, begged that the tooth might be extracted. This was done, and the paralysis disappeared in less than a week.

Mr. R. H. **Woodhouse** thought that Dental practitioners ought to confine their attention to the care of the dental tissues. They might be inclined to be more heroic in hospital practice and do operations which, for his part, would not be attempted in private practice.

Mr. **Hutchinson** said probably many of the members knew that he had been a loyal and thorough supporter of the Licentiate in Dental Surgery. He had never for one moment asserted the position which he held as a member of the College of Surgeons, but had always appeared as a Dental Surgeon; and the point he wished to urge was that, when they carry their practice from the regions of the mouth they ought not to be satisfied until their names are placed on the Medical Register.

Mr. LAWRENCE READ thought there had been a great waste of time in discussing a question which was quite beyond the rules of the Society.

Mr. GADDES briefly replied, stating that he agreed with regard to what Mr. Hutchinson said that it was a part of General Surgery; but he should like to know where Dental Surgery ended, and where Oral Surgery commenced. He thought that they wanted a definition of what the limits of Dental Surgery were. With regard to hospital practice, he thought that it should be a type of what should be done in private; for himself he could discern no difference.

At the conclusion of the meeting Mr. VERRIER demonstrated the use of his new Continuous Gum Furnace.

ODONTO-CHIRURGICAL SOCIETY.

THE Annual Meeting of this Society was held in Edinburgh, on Monday, March 13th, Dr. JOHN SMITH, F.R.C.S., President, in the Chair.

The TREASURER (Mr. Finlayson) reported that the income of the Society for the past year amounted to £47 15*s.* 6*d.*, and the expenditure to £45.

The office-bearers were re-elected for 1882-3:—

DENTITION IN THE HORSE AND OTHER ANIMALS.

Principal WILLIAMS, Edinburgh, made an interesting communication on the subject of "Dentition in the Horse and other Animals." After some preliminary remarks, he said he might state, in the first place, that a horse had 40 teeth—12 incisors, 4 canines, and 24 molars. In a specimen which he held in his hand, the number of teeth was found to be 44 (the typical number), and, remarkable to relate, they were the teeth of a mare, in which, generally, the canines were wanting, or very rudimentary. When they were there, they were in the lower jaw, and, as a rule, they were not to be found in the upper jaw. But, in this case, there were two well-developed teeth above—a most remarkable circumstance, the like of which he had never seen before. One of the molars was diseased, and had to be removed. The mare lived for some time after that, and he watched the case very carefully.

A foal was born with two central incisors in each jaw, and a calf had eight incisors at birth, or a few days afterwards. A pig had four incisors at birth, or a few days after. He might state here a remarkable fact. In the horse the incisors were the central teeth; in the calf the central ones were cut first, and the side ones (corner) afterwards. But in the pig the corner incisors were cut first. That was a very kind arrangement of Providence, for, when a pig was sucking its mother, they knew how it tugged and tore at her, and, if the incisors were in the centre of the mouth, they would injure the lacteal parts. That was, however, prevented by there being only one incisor at each corner.

When nine weeks old, the horse had four incisors, and when nine months there was the appearance presented by the very nice specimen which he now showed to them. There were in it four incisors cut and two cutting. At twelve months old the infundibulum, or "mark" of the central teeth, was commencing to be obliterated by the wearing down of the teeth. There were no changes in the incisors of the horse till he was two and a half years old, when the central ones were shed; at three and a half years the lateral ones; and at four and a half years the corner ones. At five years of age the horse was said to have a full mouth. He might state that no amount of care in the breeding of the horse, or in its feeding, made any great difference in the process of dentition. A Highland pony would have as full a mouth as a highly pampered horse. Perhaps, in some cases, where animals were very highly fed, the corner incisors might be cut a month or two sooner than if the horse was otherwise treated. But if they turned to the cow they found a remarkable thing. He had said that the calf had eight incisors. At the age of one year and nine months the central temporary incisors were shed, and the permanent ones cut. If we took an animal of the Highland, or any of the unimproved breeds, although we found that, at two and a half years of age, the central permanent incisors were cut, still such an animal did not have a full mouth of permanent teeth till four and a half or five years of age. On the other hand, they found that improved breeds had at two years of age four permanent incisors. At two and a half they would have six, and at two years and nine months they would sometimes have a full mouth. They were as well furnished with teeth in every possible way at the age of two years and nine months as the unimproved animals were at five years of age. The science of agriculture, while it enabled the farmers to grow two blades of grass where only one grew before, almost enabled them to raise two animals instead of one. In the same time that one unimproved animal took to arrive at maturity they would have two improved ones in the same condition.

As regarded the molars of the horse, there were at birth, or shortly afterwards, three temporary molars in each jaw. At the age of one year the first permanent molar was cut, and it stood fourth in the row. When the horse was two years old the second permanent molar was erupted, and it stood fifth in the row. At three years, the two anterior temporary molars were replaced by permanent ones. The sixth molar was cut, and at the same time the remaining temporary molar, which stood third in the row, was replaced by a permanent one. He had an explanation to make with reference to the fourth molar. It was the shortest molar in the mouth, and it was the tooth that was most frequently diseased. His experience was, that amongst the herbivora—and he might include the pig—caries of the teeth did not exist; that is, the kind that affected the human teeth. He thought that, in these animals, there was no caries, but necrosis. This molar was a short tooth; but continued to grow almost as long as the animal lived. He then exhibited a specimen in which the obliteration of the nutrient foramen was nearly completed; the circulation thus cut off, necrosis of the dentine resulted, and he believed, that was the only actual disease there was in the herbivora that we could compare with caries. He exhibited a specimen which had become soft, and, as a result, splits had taken place in the tooth. In consequence of that, the food had worked up into the cavities of the face, and, as a result, there were great discharges from the nostrils. One of the symptoms of a diseased tooth was a fœtid discharge from the nose, continuing often for a long period. If, by examination, portions of food could be found in the discharge from the nose, this would point conclusively to the fact that a cavity had been formed in the tooth which admitted of the entrance of the food into the facial sinuses.

The dog had 42 teeth, and the arrangement was not quite so symmetrical. In the dog caries was found, as true as it was found in the human being.

Then, as to camels' teeth, he had several specimens which he had received from India; but he had little to say with regard to them. It would be observed that in the upper jaw there were only two incisors, as they were termed by some writers on anatomy; but they appeared to him to be more like canines. There were only two canines and two incisors. It was a remarkable arrangement that in the ruminating animals the incisors were in the lower jaw only.

A beautiful arrangement existed with reference to the ox's teeth. They were fitted in quite an elastic way, and not fixed. When the chisel-like teeth were made use of in the act of grazing, there was an elastic cushion which prevented fracture of the teeth. He never saw a diseased tooth in the cow, and broken teeth very rarely. Notwithstanding the force with which a cow grazed in a field, and the liability of coming into contact with stones, it seldom happened that the teeth were broken, owing, no doubt, to the fact that they were on an elastic cushion. Returning to dentition, he might mention that young oxen—two or three years of age—sometimes began to lose flesh, and many of them were condemned all over the country as suffering from chronic disease, and very often destroyed. The majority of these cases were suffering from the crown of the temporary teeth remaining in the gum, and preventing the animal from masticating its food. (Several specimens of these were shown.) These animals were supposed to be in a dying condition, and he had found in many cases these teeth sticking into the gums, and preventing the animal from eating. There was a man in the North of England who followed the profession of an animal dentist. He went about and examined the cattle, and gave them relief at once—by removing the portions of the teeth that were troubling them.

The Principal then exhibited a specimen showing the formation of a tumour, and several scores of teeth in a cavity. They would notice that the teeth were very imperfect. He had seen tumours of that kind with 500 imperfectly developed teeth. It would be very interesting to be able to explain how these were formed. He had seen two or three cases of the kind, and the late Professor Dick had a specimen containing an immense number of these imperfectly developed teeth. He had also seen teeth growing from the petrous portion of the temporal bone, and he had removed from one animal three of them consecutively one year after another. It was a most remarkable thing, and very difficult to account for. He had also seen teeth in testicles, and various parts of the body, enclosed in little tumours. These teeth were generally very hard. The teeth from the petrosa were excessively hard. They were most difficult to remove, requiring very great force before they could be detached from the surroundings, very often breaking, and breaking with a fracture like ivory. They seemed to be very hard dentine; and why they should be there was beyond his comprehension. He exhibited a specimen, and pointed out that the gum came very near the crown of the teeth. With regard to the removal of the molars, it might be observed that the proportion of teeth exposed was very short; and when they took into consideration the length of the fang, as shown in the specimen now exhibited, they would understand how extremely difficult the removal of a tooth became. He had, however, removed them without any difficulty whatever by trephining. He thought that it was by far the most humane way; for, however strong the forceps might be, there was very great danger of fracturing the jaw, owing to the great length of the fang. It was difficult to get anything to grasp the molar. They could not fix the mouth of the horse in the same way that they could fix the mouth of a human being. Then, if they used chloroform, or any anæsthetic, there was great risk of the animal being suffocated by the hæmorrhage. He had trephined the lower jaw, and he considered it was the most expeditious and best way of dealing with such cases. He then exhibited a specimen showing disease in the facial bone (Osteoporosis), and where the teeth were quite healthy. It was an animal five years of age. That was not an uncommon disease, and it had been increasing of late years. He had seen more of it since foreign horses had been brought into the country. In this disease the skeleton became excessively brittle. He had a specimen showing that 24 ribs of a horse had been fractured, some of them in three or four places. It was remarkable that, although the bones in the face were the first to suffer, the horse might continue to have the disease, and still the teeth did not suffer. He then exhibited two cases of teeth, each of which seemed as if it contained another within it. He had only seen those two cases in all his life. In his concluding remarks, Principal Williams said that he should have been glad if he had thrown any light on the disease of the teeth. If the information he had given as to the absence of caries in the herbivora—if the information he had given, that after a long experience he had not met with what he considered pure caries in those animals, would throw some light on the question of food, or something else which might be the cause of caries in the human being—he should be highly gratified. He begged to thank the Society for the attention with which they had listened to him.

The CHAIRMAN said he hoped that the subject brought before them by Principal Williams would not be allowed to pass without giving it careful consideration. There were many valuable points in it, not the least interesting being those that had reference to the difference in the period of dentition produced by the altered circumstances in the modes of life of different animals.

Mr. HELE, Carlisle, said he was anxious to ask Principal Williams whether the alteration of the period of dentition affected the regularity or irregularity of the teeth—whether the rapid development was characterised by any malformation ?

Principal WILLIAMS said that sometimes there was malformation, but generally, as the jaw expanded, the teeth got all right.

Mr. WILSON, Edinburgh, said that in the Factory Act rules there were long tables as to the state of the teeth of the children about twelve or thirteen years of age. It was shown then that, even in the teeth of the human subject, there was great irregularity; and where there was an irregularity of the development—where the teeth were erupted earlier than the average—the physical development of the individual was equally advanced. Apparently, they might conclude in the same way that, in the rapid development of the teeth of the cow, they might have the physical development in the same way. As to horses escaping toothache, he suspected that the plan, not of extraction, but of displacement, as practised by Principal Williams, was almost identical with the dentist's use of the elevator.

Dr. WALKER, London, said that he had had experience both in the agricultural districts in the West of England, as well as in London. At first he found caries much more common among children in London than in the West of England; but latterly he had found as much caries amongst the children in the country as in the towns. He did not know whether it might be due to the fact of the agricultural classes being now much better fed, and from the fact of their having meat regularly on their table. He found that they were not content unless they had meat every day. If the herbivora were free from caries, might it not be that the food had something to do with the condition of the teeth? It might also be due to nervous irritation, produced by an excited brain at an early age. In the West of England many of the children were sent to work early in order to earn money for their parents. It was a new line of thought to hear from Principal Williams that caries was not found in herbivora. He thought that he could count on his fingers the number of children he knew who had teeth free from caries at the age of six. As to the treatment of horses, there was a man in London at present doing a very extensive practice as a horse surgeon-dentist in treatment of laceration of the tongue. The external edges of the molars were so sharp in many cases as to cause laceration of the tongue. That was frequently due to the bit touching it; and this man was reaping a rich harvest by carrying a file in his pocket and rubbing the teeth.

Principal WILLIAMS said he found that veterinary surgeons often rubbed the teeth with files when the state of the teeth had nothing to do with the condition of the horse. He thought that the gentleman in London referred to was making a speciality of nothing at all. There were no doubt cases where it was necessary to file the teeth, but there were hundreds of cases where the teeth were filed when it was not necessary to do so.

Mr. FINLAYSON asked if the porous disease of the bone referred to by Principal Williams had been found in the Highlands or in the towns?

Principal WILLIAMS said he had found it in all kinds of animals—in Shetland horses, and in all breeds. It was very commonly found in horses in pits.

The CHAIRMAN again expressed to Principal Williams the thanks of the Society for his kindness in laying such an interesting communication before them.

THE DENTAL CURRICULUM.

The CHAIRMAN said—Some questions of considerable importance to Licentiates in Dental Surgery having been lately before the

Executive Committee of the General Medical Council, a very uniform opinion has been expressed by the resident members of the Odonto-Chirurgical Society that an opportunity should be afforded at this, its annual and larger meeting, of considering such matters, and ascertaining the views of the Society regarding them. Members are doubtless aware of the letter addressed by Professor Turner, one of the Edinburgh representatives at the Medical Council, to the Executive Committee of that body, wherein he desires to obtain more specific information in reference to important details applying to the education, preliminary examination, and registration of dental students. In that letter, which is dated October 31, 1881, Professor Turner asks whether, as in the case of medical students, dental students ought not to be allowed to count one year of an apprenticeship, as one year of the four of professional study required. Again, three years' instruction in mechanical dentistry is required; and Professor Turner draws attention to the fact that it is not stated whether those years must be taken during what is termed the four years of professional study, or may be taken in whole or part antecedent to registration as a dental student. He therefore considers it advisable that the expression, "Four years in professional studies," should be more precisely defined, and adds that it seems to him only reasonable that some portion, if not the whole, of the three years to be spent in mechanical dentistry should be allowed, even if taken before registration, to count, since there is nothing rendering a literary examination necessary previous to entering on workshop duties, as there is prior to entering on a course of scientific lectures; and again, that it is scarcely practicable to go through an efficient training in the workshop, if during the same period the student's time is to be occupied in attending lectures and hospital practice. Such is the general import of Professor Turner's letter, which will probably lead to a settlement of the matters touched upon at the next meeting of the Medical Council. But pending such settlement, it seems fitting and expedient that this Society should express whatever opinions it may entertain in connection with this subject. Perhaps the most important matter for consideration here is the difficulty pointed out in the last clause of Professor Turner's letter, when he alludes to the inexpediency, if not impracticability, of an efficient workshop training being followed out while attending lectures and hospital practice, since it must be remembered that, even were there sufficient time for such training, the centres of dental education and examination are very few in number, and in view of the possible influx of dental students from provincial districts year after year, it would be difficult to find in such centres an adequate number of registered practitioners willing to afford each candidate three years' mechanical instruction in his workshop. These seem the principal questions at issue on this matter. Their importance is considerable, and Professor Turner certainly deserves our thanks for the trouble he has taken with regard to them. He quite agreed with Professor Turner that it was necessary to bring this matter before the General Medical Council. He thought it ought to be left to the option of the candidate whether or not his mechanical instruction should be taken before or after his preliminary examination. Many lads coming from provincial districts might be very good mechanical dentists before they come to the town. A lad might have been an assistant to his father, and it would be a very hard case to say that, because he had not taken his preliminary examination before he became a good mechanical dentist, he must enter the workshop for other three years. He also thought that the fact of a lad having spent three years as an apprentice in the workshop might be taken into account as one of the four years of professional instruction of the curriculum. He held that the mechanical training was equally important with the class and hospital instruction; and he would suggest that the four years' professional instruction, more properly so called, might be reduced to three years, in virtue of a candidate having completed his mechanical instruction. The amount of class attendance and hospital attendance demanded would occupy any student fully two years. It was not thought very advisable by the licensing boards to cut it so very fine as that. They could scarcely cut it down to less than three years; but at present four years was absolutely required after passing the preliminary examination. A lad must be a dental student for four years at present, and during that time he was expected to take his mechanical dentistry. But if a student who had a good mechanical education came forward, it would be desirable to say to him, "As you are already a good mechanical dentist, we will consider three years sufficient for you." This would diminish the four years by one year, in consideration of his having acquired a knowledge of mechanical dentistry.

Mr. Macleod said that he thought there was a slight misconception with regard to the subject. The Medical Council had not said that four years of professional study should be gone through by each dental student, but had said to the medical student, and therefore by implication to the dental student, that the preliminary examination in arts should be passed four years prior to going up for the final professional examination. They, however, stated the kind and quantity of professional instruction which he had to receive during the period of study. Amongst the rest was this: "that three years' mechanical dentistry should be gone through;" and he (Mr. Macleod) understood that these three years of mechanics formed part of the professional study. He held that if it was not so, it ought to be so; because the mechanical training that a young man received was the fundamental, and therefore an essential portion of his education. As the Odonto-Chirurgical Society, they must insist on the fact that the mechanical education the student received, should be recognised as part of his professional training. They must not allow it to be taken as such *ex gratia* by any licensing body, or by the Medical Council. This being granted, they find that the other subjects of study, as ordained by the Medical Council, occupied two years, making in all a period of five years' study. The English College of Surgeons, which held a charter of its own, and was altogether independent of any control of the Medical Council, enacted that a dental student should be engaged during four years acquiring his professional knowledge; and must pass his preliminary examination previous to beginning such course. But with what the Royal College of Surgeons in England resolved upon we have nothing to do. We are subject to the control of the Medical Council, and to whatever they enact we must give due submission. Keeping this in view, we may see good reason in the question put by Professor Turner, and possibly find that the answer to it is simple and evident. Professor Turner, taking a sound and common sense view of the situation, asks, Why should the dental student be compelled to pass his preliminary in arts four years prior to his final examination, when that preliminary in arts is not necessary to the acquisition of proper mechanical knowledge, although it is absolutely necessary to the thorough understanding of the purely scientific and technical studies, which the student takes up when he enters on hospital practice and college tuition? This question contains within itself the answer. If the Medical Council enact that the dental student should pass the preliminary four years *prior* to his final professional examination, they would commit a mistake; for, having resolved upon a curriculum which necessitated five years' study, and of these, three to be devoted to the mechanical branches of dentistry, it must be evident that the knowledge implied in the preliminary is not absolutely necessary for such mechanical instruction; while, during these three years, the student might carry on a course of reading, the better to qualify him for the pass. Then, why compel such students to take the preliminary until they are about to enter upon their collegiate studies? If, on the other hand, the Medical Council deem it fit to compel the student to pass the preliminary before beginning any of his professional studies, then, as these three years' mechanical training do form part of his professional training, the Council must, to carry their action to its logical conclusion, ordain that in the case of a dental student, this preliminary must be passed five years prior to his going up for his final examination. He (Mr. Macleod) was sorry to see that the Edinburgh College of Surgeons had returned an answer to Professor's Turner's letter, which contradicted itself. This answer was to the effect that the three years' mechanics might be taken either *before* or *after* the preliminary, but that four years of professional study had to *succeed* the preliminary; and that time spent prior to this in acquiring mechanical knowledge would not count. The College of Surgeons, however, proposed that *while these years are not to be recognised, they were at the same time to be held valid.* Valid for what? How could anything be held valid that was not to count? Now, let them think of the cost entailed upon a lad who had served three or five years' apprenticeship in the country (as all cannot serve their time in the city), if these three or five years are not counted as part of his professional studies. It simply meant that instead of five years, our country apprentices would require to spend seven or nine years in professional study. Mr. Macleod also said that he thought there was an erroneous limiting of the term *professional studies* to the collegiate course, and demanding four years of such; when it is quite possible for a lad of average ability to fulfil the collegiate requirements of the Medical Council in two years. Even taking the way in which Dr. Smith has put the matter to-day, one year's waste of time is still necessitated to the student, as it compels him to take three years to accomplish what he might do in two. This is a gross injustice to the student. He did not go so far as to say that every young man should be recommended to go through in two years; some of them might take three or even four; but if that was through force of circumstances, inclination, or natural impediment, no one could help it. But it was not for any body of men to place legal impediments in the way of persons fulfilling a task which had been set before them, or to make the access to the Profession more difficult than it requires to be. What advanced education and higher culture might demand in the future he could not say; what they had to do with was the present. And looking at the necessities of their training, he thought that the Society should give it as their opinion that the preliminary examination should not be demanded of the dental student until immediately prior to his beginning the collegiate education. He would then be permitted to take his mechanical training in such places as his circumstances compelled; and that, as now, for a period of three or more years as he chose; and the members of the Society, as practical men, knew that even five years was a short period in which to turn out a really first-rate mechanical dentist. That this would be for the benefit of the Profession and the public he had little doubt, as the following time-table of differences between time spent in five years, and in a three years' apprenticeship, and the time demanded under the regulations of the Royal College of Surgeons of England, would most conclusively show. In a five years' apprenticeship of 52 hours per week, and allowing a month each year for sickness and recreation, he found that the student spent 12,480 hours; and in a three years' apprenticeship, 7,488 hours, in learning the mechanical portion of his training. But if during his collegiate course the three years' pupil took but one month's holiday, and devoted the remainder of his vacation to mechanical work, he would spend in all 8,320 hours. In the case of the student fulfilling the requirements demanded by the Royal College of Surgeons of England, the whole time which he could devote during the four years to the acquirement of the mechanical part of his Profession was 3,744 hours, or 3½ times less than that of the five years' apprentice. A recognised authority had said that the dentist who was possessed of good mechanical abilities and little surgical training, would be likely to do less injury to his clients than one who possessed the advantage of all the surgical training, and had little or no mechanical ability. And in view of this opinion, and the time-table already given, he would leave the Society to judge as to the course of training best calculated to produce an efficient practitioner. He therefore moved the following resolution as the deliverance of the Society on the subject:—"That although the Society are of opinion that the three years' mechanical training is, and always must be, an essential part of the professional education of the dental surgeon, they do not consider it necessary that the dental student should be compelled to pass the preliminary examination in arts until prior to beginning his hospital and surgical studies."

The CHAIRMAN said he quite agreed with what Mr. Macleod had said. The question at issue in Mr. Turner's letter, however, was not a change in the curriculum, but it was to interpret how the studies prescribed were to be arranged, and that was the reason why the College of Surgeons did not enter into any alteration of it. The College had not entered at all into the question of the extent or duration of the curriculum, but merely whether or not the imperative amount of mechanical instruction might be taken before the other classes and the hospital instruction. The question was, what was the interpretation that was to be put on the curriculum—whether a lad might take his mechanical instruction before he passed his preliminary examination, and if so, whether it would be valid, although not in that case counting among the four years' post-preliminary studies.

Mr. MACLEOD said he did not think he had said anything that would lead it to be supposed that he wished the Medical Council to change the curriculum. He held that it was not possible (as the

English Royal College of Surgeons seemed to think) for a student to do three years of mechanical dentistry, and pass through the other portions ordained by the Medical Council, in four years. He was anxious that these three years of mechanical dentistry should be carried out in their entirety, and that wherever passed, be it in town or country, the whole term should be honestly recognised. He thought that the Society should claim for the student liberty to pass the preliminary examination at any time prior to beginning his hospital and surgical studies.

Mr. Wilson said it was simply an absurdity to suppose that any student could take his mechanical dentistry and medical, dental, and hospital classes within four years. They wanted to extend the number of years, and so were really proposing that the curriculum be altered. If they were to take three years for the mechanical and two for the medical, that would be five. If that were fixed as the minimum, they would not be interpreting the present regulations, but proposing an amendment.

The Chairman said that it was leaving it optional. The intention was not to interfere with the curriculum, but the question was, Should it be in the option of the student to take his mechanical dentistry within the four years after the preliminary, or take it outside, before the preliminary?

Mr. Macleod said that the Dental Act neither fixed the kind of study nor period of study. The Licensing Bodies, under approval of the Medical Council, arrange the curriculum, and it was to clear up certain doubts as to the curriculum, as much as anything else, that had led Professor Turner to put his queries to the Medical Council. He thought that the Society ought to let their views on the subject be distinctly known.

Mr. Wilson said that they wanted to encourage the dental students to become medical students as well.

Mr. Campbell, Dundee, said he had much pleasure in seconding Mr. Macleod's motion, and he thought it should be put to the meeting. His feeling was that they should do all they could (consistent with good service to the public) to make the attainment of the dental license easier, and not more difficult. By and by the general public would require all the dental skill they could get, and for a time there would not be so many in the ranks of the Profession as now. He thought that in many cases the three years' mechanical training might be acquired by young men before coming to the centres where the medical schools are. In provincial towns the three years' mechanical training might be got, then they might pass their preliminary examination, and go to the centres, such as Edinburgh, Glasgow, and London. He considered that the mechanical training was not inferior in importance to the medical.

Mr. Rees Price said he thought this matter was made more of a difficulty than it really was. In England most of the men who went to the hospitals passed their arts' examination at the school. He did not know anything about the Scotch education; but it seemed to him that most of the men likely to become dentists would pass the arts' examination before they commenced their mechanical training.

Mr. Wilson said he was afraid that very few would be qualified to pass the examination at the time they usually left school for apprenticeship.

Mr. Hele said he thought that all students, before entering on any part of their work, should pass a preliminary examination. He himself had felt the want of the arts' examination, as it had prevented him from taking full rank. While he thought they should make the curriculum as easy as possible, yet he held that those who went in for dentistry should go in at the "strait gate" of an arts' examination.

Mr. Macleod's motion was then unanimously adopted; and it was agreed to send a copy of it to Professor Turner.

Mr. Wilson said that another important question requiring to be settled was that of registration. At present dental students could only register in London, and he thought it should be sufficient that they register in the medical register. It would allow the classes that they attended to count for the medical curriculum also. Otherwise they must enter themselves at the same time in both to do so. Then as regarded the curriculum required by the different licensing bodies, it would be an advantage if there was something like uniformity in them. They would require something more definite than merely saying one course of lectures on a certain subject. While in Edinburgh in the medical schools the winter and summer courses of lectures must consist of a definite number; in London, he understood, these courses did not have the same number at all, and that gave the London students an advantage. It would be much better, in giving the curriculum, to state the minimum number of lectures which would constitute the course of each subject.

The Chairman said that these were very important subjects. He had had a good deal of correspondence in regard to the registration. As to the lectures in London, they were not given every day as here, sometimes only twice a week. A course of chemistry might mean a course of chemistry in a school. With regard to registration, he did not see any difficulty in allowing the students to register in any city in which there were licensing centres. As to the curriculum being made more definite and uniform, these were things that might be considered.

Mr. CAMPBELL, Dundee, said he thought it would be very desirable for those dental students who expected some day to obtain the full membership, if the two grooves could be made to work in such a way that they could be got together more easily.

Mr. WILSON said that what he meant was that there was no reason for having a special dental register at all.

The subject then dropped.

EXAMINATION QUESTIONS.

WE have been favoured with the written and some of the *viva voce* questions at the recent First Professional Dental Examination at the Royal College of Surgeons of Edinburgh.

The written questions were :—

ANATOMY.

1. Give the structure, form, and attachments of the Diaphragm; mention the position of the Foramina, and what passes through these foramina.

2. Give the Anatomy of the Tongue, its connections with other structures, the source from which its nerves and blood-vessels are derived, and the functions of its several parts.

3. Describe the origin, course and relations of the Common Carotid Artery on each side of the neck.

PHYSIOLOGY.

The Constituents of the Blood, what are the changes which take place during coagulation, and the causes accelerating and retarding it?

CHEMISTRY.

1. Explain or describe the phenomena of efflorescence and delequescence; mention some of the substances that are most liable to one or other of the changes.

2. Mention the chief points of difference between Arsenic and Antimony when submitted to March's process; specify the character of the gases liberated, and of the stains on porcelain.

3. What is a Thermometer? Explain its construction, and the difference between Centigrade scale and that of Fahrenheit.

The following were some of the *viva voce* questions :—

ANATOMY.

What is the Pharynx; and asked to name the muscles entering into its formation.

How are the Anterior and Posterior Pillars of the Fauces formed, and what structure lies between?

The Muscles of Inspiration, and the changes which take place during inspiration and expiration.

The attachments of the Intercostal Muscles.

Given the Humerus, and asked to name the muscles attached, and to which side it belonged; to specially state the muscles which would flex and extend the arm, and to give their attachments.

Given the Scapula, and asked to name its processes, angles and borders, and the muscles attached.

How is the Supra Scapular Notch formed into a Foramen, and what passes through it?

To name the branches of the External Carotid Artery, and the course of the Internal Carotid Artery.

The Inferior Maxillary Bone, its processes, borders, and surfaces, and the muscles attached.

CHEMISTRY.

How would you detect the presence of Carbonic Acid in the air, and in a well.

Whether the air was a chemical compound or a mechanical mixture.

How many parts of Oxygen and Nitrogen in the air.

How would you obtain Nitrogen from atmospheric air, and what combinations would be formed with the Oxygen.

The combinations of Nitrogen with Oxygen, and give their symbols.

How are Acids, Basic and Neutral Oxides formed? Give examples of each.

How would you detect if Lead were mixed with a substance.

PHYSIOLOGY.

The Changes which take place in the Blood during inspiration and expiration.

The Circulation, how the Blood enters the heart, and leaves it. The diastole and systole of the auricles and ventricles; the difference between Arterial and Venous Blood.

Two out of three candidates were referred to their studies.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

To the Editor of the DENTAL RECORD.

SIR,—I see from your RECORD of this month, that Mr. Hardie, of Alloa, accuses the Glasgow examiners of partiality, an accusation which I am convinced can only arise from one who has failed to satisfy the gentlemen forming the Dental Board. As he distinctly states that he is quite prepared to substantiate all he says in his letter, I think it would add much greater weight to his assertion, and at the same time it would enlighten all those interested, if he published the name of the examiner who stated that they give a preference to Glasgow men.

I am fully convinced that if Mr. Hardie makes a careful examination of the members who have passed, he will find that the larger proportion of those remitted back to their studies at each examination have been Glasgow men. As an example, it might be well to draw Mr. H.'s attention to the examination held during July, 1881, when there were 14 candidates presented themselves for examination, of whom 10 were strangers; the result being that all the strangers passed and only 1 out of the 4 Glasgow men was successful. To all impartial minds the above, I think, bears out what I have said. Being a Glasgow man, and one of the rejected, I tried again, was successful, and now sign myself,

L.D.S.F.P.S.G.

Editorial.

DENTAL PATHOLOGY.

If the scientific practice of any branch of Medicine be estimated by the accuracy of the knowledge of diseases, perhaps Dental Surgery may hold an average position. But they who have the love of the Dental Profession at heart, and desire its advancement, must exercise their best endeavours and highest faculties to promote the philosophic status of the specialty. To hold our own in these days of rapid progress, necessitates diligent investigation. The field for labour is extensive, and even the more limited area of Dental Pathology is largely eclipsed by non-luminous ignorance. The etiology of Dental caries, of the polished erosion so frequently seen at the necks of teeth, of pyorrhœa alveolaris, and of other affections of the tooth tissues, has, in each instance, yet to be met with a satisfactory explanation. The condition of the sockets of recently extracted teeth, mentioned by Dr. Rich before the Odontological Society of New York (see page 213), is one, the pathology of which we, undoubtedly, wish to know more about. Numerous teeth, apparently sound, are extracted because of exostosis of the cementum; and if it be ascertained as a fact that the periosteum may elaborate bony tissue on its alveolar as well as on its cemental surface, to the agony of the individual and eventual loss of the affected tooth, investigators ought not to rest until something of the etiology and pathology of this disease, at all events, be known.

ANNOTATION.

THE death of Mr. Chas. Robt. Darwin, at the age of 73, has been the subject of universal regret. The illustrious author, who revolutionised the study of Natural History, was not bedecked with any of the State honours of his own country; but the hero-worship to the great writer of the "Origin of Species" will outlive, in the struggle for existence, the more ephemeral Monarchial distinctions. At the funeral ceremony in Westminster Abbey, where the remains of the great investigator were laid to rest, a large congregation assembled, including the most distinguished men in Science, and representatives of our Universities, learned Societies and Corporations, of the Law and the Church.

GOSSIP.

THE dietary of 2000 A.D. is thus prognosticated by Dr. Milner Fothergill:—"The younger portion of their listeners would look up and inquire—'Had they teeth to chew such food?' in sceptic tones. (It was curious to hear such an inquiry come from betwixt the most even and regular teeth. On looking closer, it was seen that not a speck of decay disfigured their beautiful teeth. But it was also to be seen that all the teeth were artificial—absolutely all. The dentist had nipped off every crown as soon as the tooth had ceased growing, to prevent the teeth becoming carious; and so saved the roots in the jaw, upon which were fixed false teeth. Such plan had been found the only practicable method of preserving the mouth from deformity and disfigurement.) Then the aged persons shook their heads ominously, and replied—'Ay: they had teeth of their own in those days! Folks died with some of their teeth still sound; even at fifty. They were a different kind of people then to now!'"

THE influence of high atmospheric pressures upon animal life has been examined by M. E. de Cyon—*Comptes Bendus*—, who finds that they modify sensibly the normal relations of the tension of the gases contained in the blood. This action is exerted upon the circulatory and respiratory systems. Pure oxygen is not a special poison for the organisms, and animals die in it because the carbonic acid, the chief excitant of the vaso-motor and respiratory centres, being sensibly diminished, and the circulation and respiration thereby arrested. The movements of the heart are quickened at first because the oxygen, which is the normal excitant of the nerves and the accelerating centres, augments their activity, whilst the absence of carbonic acid diminishes the moderating action of the pneumogastric nerves.

Vipers abound in some parts of France, more especially in Vendée, Loire-Inférieure, Haute-Marne, Lot, and Côte d'Or. In Haute-Marne 57,045 were destroyed in six years, a premium of about 2*d.* having been offered on each animal. According to M. de Quatrefages, the larger domestic animals recover pretty quickly, without treatment, from a viper's bite; but goats, sheep, and dogs often succumb if not treated. A bitten man may recover spontaneously after considerable suffering; but the issue is often fatal. In view of these facts, M. de Quatrefages has called attention to the treatment with permanganate of potash, recently found successful by the Brazilian, Dr. de Lacerda. The doctor insists on the importance of preparing the solution only at the time it is required, and advises keeping small packets of about 1½ grain of the salt, and a flask holding about ⅛ oz. of water. The Pravaz syringe is used in injection; a ligature is placed above the bite, and the tissues are compressed to promote diffusion. The method is applicable to domestic animals as well as men.

A new method of tempering metals, especially steel, has been brought before the Paris Academy by M. Clémandot. It consists in heating the metal to a cherry-red, compressing strongly, and keeping under pressure till completely cooled. Steel thus, it is said, acquires excessive hardness, and such molecular closeness and fineness of grain that, when polished, it looks like polished nickel. Compression being an operation which can be measured, graduated, brought and kept within set limits, one can temper at such and such a pressure, just as one may work with such and such a pressure of steam. The boiling temperature of zinc was estimated at 1040° C. by MM. Deville and Troost. M. Edm. Becquerel, however, obtained the figure 932°, showing a wide discrepance. M. Violle has lately investigated this matter by a new method, and he confirms M. Becquerel's result, the number he obtained being 930°.

M. Marey has lately contrived an instrument which, pointed at a bird in flight, like a fowling-piece, and let off, gives easily twelve successive photographic images of the bird. The exposure for each image is 1-700th of a second; but on a bright day it may be reduced to 1-1300th. If the series of images be arranged in a phenakistiscope, the aspect of a flying bird may be reproduced in such a way that the motion may be easily analysed. The principle of the contrivance is the same as that of the *photographic revolver* which M. Janssen made for observation of the transit of Venus.

The following "professional" American advertisement was recently noticed in *Items of Interest*:—

EXTRAORDINARY OFFER IN DENTISTRY.

In order to advertise my business, I will, until the first of March, 1882, make the following extraordinary offer: I will make the best artificial teeth, fully warranted in every respect, for $10 per set; and with every set made at that price I will give a stem-winding American watch, beveled glass, nickel silver cases, a good time-piece and a beautiful watch in every respect. The watch can be seen at my office at any time. In regard to my work, I would call attention to the fact that I have made over 1200 sets of teeth in this and adjoining counties, and point with pride to the fact that, so far as I know, they are all giving entire satisfaction.

DR. L. S. SMITH,
Mussey Block, Elyria, O. Dentist.
Office days: Mondays, Wednesdays, Fridays, and Saturdays.

THE vacancy in the Council of the Royal College of Surgeons in Ireland, caused by the resignation of Mr. Jacob, has been filled by the election of Mr. J. A. Baker, F.R.C.S.I., dental surgeon, who obtained a majority of seventeen votes over his opponent, Mr. Nixon. Mr. Baker was, last year, one of the Vice-Presidents of the Odontological Society.

THE annual Distribution of Prizes to the Students of the National Dental Hospital and College will take place at the Beethoven Rooms, Harley Street, on Wednesday evening, the 31st inst. Lord Viscount Enfield, President of the Hospital, will preside.

FROM experiments on the action of sulphur dioxide on nitric oxide, Lunge concludes (*Berichte*, xiv. 2196) that, when water is present, sulphur dioxide partially reduces the higher oxides of nitrogen to nitrous oxide, even in presence of free oxygen.

THE power of the masseter muscles of the crocodile, as compared with those of the dog, exert a power of 12.8 kilos. per kilo. of its own weight, while those of the dog were 8.25.—Drs. Reynard and Blanchard.

MR. EDWIN SAUNDERS, as President of the Metropolitan Branch of the British Medical Association, will hold a *Conversazione* at South Kensington Museum, on Wednesday evening, the 10th instant.

THE density and saltness of sea-water are shown, by M. Bouquet de la Grye, to increase on passing from the ocean to the Mediterranean; and that the surface waters are less salt and dense than the lower.

MR. G. DENNIS CURNOCK, L.D.S.Eng., has been appointed Dental Surgeon to the Metropolitan Free Hospital, *vice* Mr. Harry Rose, L.D.S.Eng. resigned.

THE depth to which the chemical rays of light penetrates the clear water of Lake Zurich have, by M. Asper, been ascertained by means of sensitive albumenised paper to be, at least, 90 metres.

SEVENTY emigrants from Musselburgh, Leith, and neighbourhood, under the care of Mr. Procter, retired Dentist (Edinburgh), recently departed for Winnipeg, Canada.

To prevent the loss of small screws when removing and replacing them, it has been suggested to magnetise the point of the screw driver.

THE Synthesis of Quinine was the subject of a communication by M. Maumeré at a recent meeting of the Academy of Sciences, Paris.

THE *New England Journal of Dentistry* is the title of a new Dental journal published in the United States.

Communications.

Communications have been received from John A. Biggs, Glasgow; Frank Comer, Torquay; Dr. Best, Savannah; W. Bowman Macleod, Edinburgh; W. M. Adamson, Glasgow; Dr. Smith, Edinburgh; W. F. Thompson, London.

Books, &c., Received.

"Medical Record;" "New England Journal of Dentistry;" "Items of Interest;" "Journal of British Dental Association;" "Independent Practitioner;" "Progrès L'Odontologie;" "El Progresso Dental."

THE

DENTAL RECORD.

VOL. II. JUNE 1, 1882. No. 6.

A CASE OF REPLANTATION.

By A. H. BEST, D.D.S., Savannah, Ga., U.S.A.

NEARLY three years ago I was consulted by a lady who was at the time suffering very much with a lateral incisor. The particulars of the case are as follows:—The lady was of a most delicate constitution; in fact, one of those unfortunate individuals who had suffered from indigestion and mal-nutrition for a lifetime; so frail, indeed, was she, that I very much question, notwithstanding her height and inclination, if healthy, to be rather large, if she would at that time have weighed as much as one hundred pounds. The condition of the tooth was as follows:—Several years previous to this visit, the nerve had been destroyed and the tooth filled; the operation, however, had not been as satisfactory as was desired, and some two years before calling on me, the tooth had been treated and refilled by someone else. This latter operation gave no relief whatever, for the reason that an attempt had been made to open the pulp-canal through an approximal cavity, which had, in this instance, resulted in a complete stopping up of the canal, and the formation of an artificial opening through the side of the root, at about one-third its length from the apex; and after several days' treatment, the tooth was filled. I do not, however, think the operator was cognisant of the condition he had brought about, for he doubtless filled the tooth with every hope of success. Such, however, was not the sequel of the case, as we shall see, for after nearly two years' constant suffering, she was forced to seek relief, and in this instance applied to me. As is customary in these cases, I removed the filling, and attempted to open the pulp-canal; but, from the particular direction taken by the instrument, and the comparatively short distance from the cutting edge of the tooth, to a point where the instrument produced intense pain, I was forced to diagnose the case as above, and which was verified by subsequent events.

However, I attempted to give relief by treatment, which efforts being unsatisfactory, I determined, notwithstanding the extremely unsatisfactory condition of the patient's health, and apparent depression of the vital forces to that extent which would seem to render an operation unsuccessful, to extract the tooth, remove cause of offence, then fill and replace it in the mouth again. My reason for pursuing this course was, that all efforts to afford relief by other means had failed, and the opening through the side of the root seemed so large as to render it extremely difficult to fill that portion of the pulp-canal accessible, without forcing the material used through the opening, and thereby producing periosteal inflammation. Again, in this case the pulp-canal was closed up, about half way the length of the fang, and as it was found impossible to open it, there were, of course, doubts as to whether all the decaying pulp had been removed or not; and in fact, I rather inclined to the belief that the apex of the pulp-canal was not in that condition regarded favourable to physiological conditions of surroundings. Upon extracting the tooth I found the apex of the fang completely enveloped in a cystic sac, which was dripping with pus. When the sac was removed, the end of the fang was found to be corroded and very foul, from decaying portions of the nerve. The false opening had perforated the periosteum, and around it was particularly noticeable that engorgement peculiar to inflammatory action. The remaining portion of the root coverings were in a very good condition. After the examination of the tooth out of the mouth, it was washed in a little warm water, to which just enough carbolic acid had been added for antiseptic purposes; one-eighth of an inch of the apex of the fang was then removed, in order to get rid of the rough surface; the pulp-canal was then opened, and the entire root filled with white cement, and the crown cavity filled with gold. When the white filling in the canal had become sufficiently hard, both the apex of the canal and the false opening were drilled out and filled with gold, and finished with files and burnisher. The membrane covering the fang was kept moist during the entire time the tooth was out of the mouth. with a solution of water, glycerine, and carbolic acid, being wrapped with a clean linen cloth free from lint, which was kept wet in the solution.

One and a half hours were occupied in filling the tooth, etc., out of the mouth, and when this part of the operation was finished the cavity in the alveolus was gently syringed with the above solution, after which it was dried out with a piece of spunk, this being done to remove any blood-clot, etc., remaining, and thereby obviate pain that would result from compressing such when forcing the tooth in position. The tooth was replaced without difficulty, and with little pain, which entirely subsided in a few hours, leaving a slight soreness which lasted for two days, after which no further trouble was noticeable, and in two weeks the tooth was doing good service again.

Two years after this operation, during which time the tooth gave not the slightest trouble or inconvenience, an accident occurred, which broke off the crown just below the free margin of the gum, and three months later I was consulted with a view of ascertaining what could be done. I found the remaining portion of the root, though crownless, perfectly strong and healthy, all surroundings being in a most satisfactory condition. An artificial crown was seemingly indicated, and was accordingly placed in position, a gold pivot being used which was retained in the root with gutta-percha. I have only to add, that several months have elapsed since this operation, and every thing so far seems to indicate the desired permanency.

The special points in this case are the extremely feeble condition of the patient, the length of time the root surroundings had been inflamed, as well as the diagnosis of the false opening, etc., and the extremely satisfactory results, even of a permanent retention of the root for pivoting after a loss of the natural crown.

I think this the first case reported where, after replantation and loss of the natural crown, the root was still healthy enough to pivot on with any hope of success.

CHOKED BY A TOOTH.

By N. Miller, L.D.S.I.

On April the 27th inst., a lady and gentleman from a neighbouring town brought their son (a strong healthy boy of between 10 and 11 years) to my surgery to consult me as to the state of his mouth. I found nine of his temporary teeth obstructing the regular eruption of the permanent ones. I explained to the father what was requisite to be done, and he wished me to administer nitrous oxide gas, and extract what teeth I thought necessary. I accordingly did so, and the boy, not being the least nervous, took it freely, being unconscious in from 15 to 20 seconds. During that state I extracted seven of the temporary teeth, the last tooth being a left lower molar. Towards the latter stage of the operation the gag slipped, and the mouth closed; the patient became partly conscious, assuming a natural colour, when he took a deep inspiration, immediately after which he exhibited symptoms of asphyxia, and, raising his hand to his neck, he attempted to tear away his garments, though they were loose. I immediately bent his head forward across my knee and gave him some sharp raps on the back, at the same time telling him to cough as strongly as he could, but it seemed to be of no avail. I then tried if I could feel the tooth, but could not do so. Seeing there was no improvement, I telephoned at once to a medical man, but he must have been out, as I received no answer. I then went for the nearest medical man I could get, leaving an assistant and the father with the boy, still hoping he might eject the tooth during my absence. In about seven minutes

I returned with Dr. Marshall, who, when he saw the boy, pronounced life to be extinct.

I expressed a wish to the father that he would consent to the Doctor performing tracheotomy, and he readily consented. Dr. Marshall, with the consent of the Coroner, afterwards made a post-mortem in the presence of myself and the deceased's uncle, when he found the missing left lower molar, with fangs uppermost, firmly fixed in the larynx.

An inquest was held the same evening, when the jury came to the unanimous conclusion that it was purely accidental. The father, being asked if he attached any blame to anyone, expressed himself perfectly satisfied with the course that had been pursued during the unhappy occurrence.

I think it would be better perhaps, in a practical point of view, if all accidents of an alarming nature were fully recorded, for the benefit of those who may not have had the unpleasant experience of such. I cannot but think that amongst so many as there are in our Profession, numerous less alarming accidents occur, the recording of which would be interesting and instructive to all except the parties immediately concerned, and would show in what proportion accidents happened, each teaching its own lesson.

A METHOD OF DUPLICATING PLASTER MODELS.

By Walter Whitehouse, L.D.S.Edin.

I HAVE much pleasure in submitting to the Profession a method of duplicating plaster models, by which absolutely accurate results are obtained. So delicate is the process that even a slight scratch on an under cut of the model is reproduced, and no skill is required in working it.

In sending some Dental plates, made by electro-typing, for the inspection of the Odonto-Chirurgical Society some two years since, I also sent a model, duplicated with elastic composition, made from the ordinary recipe contained in works on Electro-typing; but the elaborate preparation necessary to prevent the composition sticking to the model, and the slight shrinkage from evaporation, caused me to abandon its use. The new composition that I am now using has been tested some months, and it is quite free from shrinkage, containing no water.

When under cuts are faithfully reproduced in a duplicate model, the advantage becomes obvious of retaining the original model for reference in finishing up the work, in case of accident in vulcanising, for turning up and finishing the bands; and, also, after the most careful packing, the bite and the teeth fitted on the gum are often slightly raised.

In working with a duplicate a careful and experienced workman can, I believe, finish three cases in four, without requiring a touch when put into the mouth—a desideratum when we remember the tediousness and discomfort to the patient of adjusting bites and bands in the mouth, and loss of time, at perhaps a busy period of the day.

As experience is of aid, even in the preparation of the details of a system so simple as this, I have decided to place the material, with the necessary appliance and instructions for its use, for disposal at the depôts.

OPERATIVE DENTAL SURGERY,

Being part of a Course of Lectures delivered at the National Dental College, London,

By W. Finley Thompson, M.D., D.D.S.

(*Continued from page* 209.)

Considering the effects consequent upon the retention of any portion of a devitalized pulp in its canals—as irritation of the peridental membrane—caused by the products of decomposition, gaseous or fluid, it may be readily inferred that such a contingency is necessarily followed by a train of complications not always easily controlled. The obvious indication is to remove every incentive to hyperæmia, preventing, if possible, lesions which might otherwise seriously involve the surrounding tissues. In this, much will depend upon the skill and judgment brought to bear in the preparation of the minute and tortuous passages which naturally follow any distorted configuration of the roots. The injurious influences of structural change are apt to be underestimated; and, for this reason, I direct attention to the importance of most effective measures being adopted.

In removing the pulp, do not allow the instrument to pass beyond the foramen at the apex of the root, as the remaining trunk of the nerve may retain its excitability in the immediate vicinity of this strait. The instruments for this purpose should be pliant, that they may be easily bent in any direction to prevent accident; for it is always awkward when a broach becomes broken in these, not infrequently, almost inaccessible repositories. Pluggers of exceedingly delicate shape are now required; which should be well tempered, and, for some distance from the points, flexible, that they may be readily adapted to the different conditions under which they are to be used. Every precautionary measure must be taken to ensure perfect impaction of the gold in the interstices between the apical foramen and the pulp chamber; for, should any interval be left near the apex, exudations will percolate through the foramen, which might, by the generation of gases, induce a pathological condition difficult to control.

Perhaps a more effective way to prevent abnormal excitation would be in the use of wire made of pure gold; which, being soft and pliant, readily adapts itself to the deviating course of the fang. But, should the wire not be suited to its intended point of location, it must be withdrawn and shaped so nearly the size required, that, with finely-pointed pluggers, it can be driven to its position.

In cases where susceptibility to thermal change exists, with a predisposing inflammatory condition of the peridental membrane, a non-conducting substance may be introduced as a substratum. Against this cause of future derangement, you will be guided as to the necessity of defensive measures, by a knowledge of the diathesis of the case.

Another method of filling the roots is with oxychloride of zinc; which may be done by using fibres of silk, saturated with a thin solution of this preparation, and carried along the nerve canal by the use of broaches, packing rapidly, that the material may not set before the cavity is filled. Where restorations are made with gold, no portion of any other material used for filling the fangs or protecting a sensitive pulp should be exposed to the secretions of the mouth, as the work will be undermined by their action.

If a temporary filling is made, gutta-percha or Hill's stopping will answer the purpose very well. This is especially adapted for what is called a test filling, after the treatment of teeth, for the reason that it can be readily applied, and also removed when occasion no longer demands its use.

Another case illustrative of the fourth stage, is shown in the prepared cavity, fig. 19.

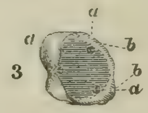

FIG. 19.

Cavity prepared in superior molar corresponding to No. 3 in fig. 1 (page 152).

a a a. Anchorages in or near buccal, ante-lingual medial, and post-lingual medial regions.

b b. The reduced wall and bevelled edge.

Here the buccal wall may be depended upon to resist its complement of the total pressure which will necessarily result from the opposing teeth coming in contact with the composite surface. But, in order to preserve the lingual wall, the basal, as well as intermediate portion, must be protected by sacrificing the frail and unreliable line of enamel to which the wall has been reduced at the crown surface. This, being diminished in thickness, as it rises from the floor of the cavity, presents a knife-like edge, quite incapable of offering resistance to lateral pressure. Notwithstanding deficiency in thickness, the enamel may be good, and capable of much service, if protected from the leverage to which its exposed position subjects it; but, in order to prevent fracture at the top or base, it must be framed in, so as to be exempt from shock, or lateral disturbance. To accomplish this, the wall must be reduced vertically until an appreciable thickness is attained, and then, with evenly mounted discs, bevelled at an angle of about 30°. The gold being carried over this bevelled edge, the effect of any pressure is to clamp the frail portion, thus shielding it from antagonistic force. The diagram, fig. 19, better illustrates the walls, angle, and contour of the prepared cavity.

In molar teeth, decay is sometimes found extending antero-posteriorly, completely through the tooth, approaching from opposite directions, until the central wall is destroyed, leaving the outer and inner plates of the tooth standing.

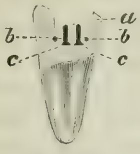

FIG. 20.

Transverse split section of lower molar from buccal to palatine surface.

a. Bevelled edge of lingual wall.

b b. Anchorages in line of section.

c c. Headed screws sunk in floor of cavity (omitted in fig. 21).

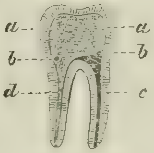

FIG. 21.

Longitudinal section of fig. 20 (antero-posteriorly) showing interior of buccal wall.

a a. Grooves.

b b. Anchorages.

c. Pulp canal filled.

d. Pulp canal prepared.

This is exhibited, see fig. 20, in the antero-posterior view of a lower molar with cavity prepared for filling, which, being split between its fangs, the actual division gives the profile of the plates, situation of the screws, and two of the anchorages preparatory to filling. This figure must be considered simultaneously with its companion diagram (fig. 21), which is an antero-posterior vertical section from the ante- to the post-proximate surfaces, showing the interior of the buccal wall. It represents one fang filled with gold, the other ready for filling.

When the roots are filled, the preparation of the cavity in the body of the tooth may be continued, as represented in figs. 20 and 21. The walls carefully dressed, and the outer surfaces finished, a fine bur should be passed along the inner portion of the plates, making four vertical grooves in the walls of the cavity. At the bottom of each groove, an anchorage or retention point is required; these grooves, two on either wall, are situated near the four angles, rather less than a line from the outer edge of the cavity, and extend from the floor to a line separating the dentine from the enamel. Especially do I lay stress on the expediency of having anchorage at the termination of interstitial cavities when situated upon the occluding surfaces of molar teeth, as seen in figs. 17 and 18, *a a*, page 208.

In fig. 20, are attachments for the gold, besides those already mentioned; two additional anchorages being formed at the foot of the walls, and midway between the four angles at the proximate edges of the cavity, while at equal distances between these walls, are inserted two gold screws. The heads of these screws are so far cylindrical that, when built in their appropriate places, all tendency to unsteadiness is removed.

The grooves and anchorages formed, with the screws in position, the filling should be commenced in one of the retaining points, the gold being conducted diagonally, intermediate between the walls; then, building from the opposite end of the diagonal, it may be worked towards the common centre situate between the two screws.

This process is repeated at the ends of the other diagonal, always approaching the centre, in which, eventually, the walls of both diagonals meet; thereafter connecting them with walls stretching from side to side of the cavity, and along the base. Four triangular cells will thus be formed, out of the floor of which the threaded portion of the screws will project.

By this methodical procedure, a network of gold is secured which, from its position, anchorages, grooves and screws, offers resistance to any change of form, being welded into a solid mass, in which the walls and cells intervening are blended and lost.

In building, do not forget to devote proper attention to packing along the vertical grooves, as they steady the filling, while receding farther from the floor of the cavity. If the gold be used in fragmentary pieces, torn from the leaf, introduced into the vertical line, and tapped gently, there is no probability of the filling becoming detached from the walls, unless, as sometimes does occur, the outer or inner plate gives way. This can be prevented by dressing down the occluding surfaces, so that the gold may be carried over the edges (see *a*, fig. 20), on the principle before explained. The outer portion, being lower than the inner, draws the standing wall of the tooth towards the filling, thereby keeping it in place; also, being built above with gold, no direct force can come in contact with the tooth.

In fig. 22 (12 and 13) are two bicuspids prepared for filling, in which one cusp only is left to each tooth. To supply the deficiency as here manifested, will require not only the investment of time, but considerable skill, for the means of attachment are not of a promising nature.

These cavities are prepared by cutting perpendicularly and transversely, with a view of preserving as much of the tooth as possible, and by forming the floor in such a manner that its interior surface shall be slightly beneath the level of the proximate and buccal, or proximate and lingual surfaces, so as to leave a slight elevation of tooth as a rim extending from the wall of the cusp entirely round the floor of the cavity. This rim acts as a support to prevent lateral displacement of the gold, the floor of the cavity having a flat horizontal surface, on which the filling is built. As in the previous cases, it is bevelled, and the gold worked over and upon the edges of the enamel. A square groove should now be vertically cut in the standing cusp, of perhaps the eighth of an inch in depth. On the step thus formed, a short screw is inserted (see *b b*). On the floor (*c*) of the cavity are three longer screws in position, as shown in Nos. 12 and 13. The anchorage, or starting point, is situated in the middle of the floor (No. 13 *c*). The filling has now a wall on one side, and a rim on the other; and, as the gold is built round the screws, it becomes firmly fixed to the floor, while the groove, and the anchorage provided in it, retain the gold in position, thus preventing any movement in the direction of the proximate surfaces.

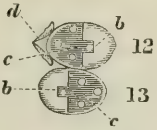

FIG. 22.

These teeth were figured in a condition of decay, see fig. 1 (page 152), Nos. 12 and 13. The white dots are intended to represent the screws.

The restoration should be fully contoured and flush with the remaining cusp, to protect it against accident; for, upon its preservation, depends the permanency of the filling.

In the extreme cases now cited, it will often be found necessary to incise the gum and lay it well back. This has been fully and extensively dwelt upon in former lectures, in connection with the use of clamps: the manner of treating the gum when impinging upon portions of the tooth to be operated upon having been illustrated in several figures.

I shall now refer you to the right lateral incisor in fig. 5 (page 199). Here the area and depth of the caries are so great that, when the diseased portion is removed, there is apparently but little upon which the filling can be securely attached. Yet, it is desirable to avoid exposure of gold upon the labial portion of the tooth.

In fig. 23 the nerve canal is laid open, illustrating a hollow, split cylinder of gold, inserted in the root previous to filling the tooth.

This cylinder is represented in fig. 24, and the cavity is prepared with a view to the insertion of this tube, the longitudinal division being

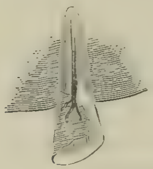

FIG. 23.

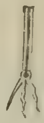

FIG. 24.

made on one side, and extending its full length to permit enlargement of the tube at a later period of the operation. The tube is inserted in a socket formed by the circumferential extension of the nerve canal to about the depth represented by the black marking in fig. 23; the upper portion of which is removed obliquely on one side, to about half its diameter, and about one-tenth of the total length. The edges, being parallel to the sides of the cylinder, are left similar in shape to the formation of a pen; on the projection of which three gold filaments or branches are soldered. When the cylinder is *in situ*, the "scoop" and filaments stand approximating the inner portion of the labial wall. The permanency of this position is now secured by building within the tube, the pressure causing it to expand and accurately coincide with the parietes of the socket.

Restoration is made along the mesial and distal walls of the cavity, in advance of the filling in the central portion of the tooth, until it reaches a line parallel with the junction of the first extension of the tube. Should the arms be an impediment to the building process, being pliant, they are thrown aside, until the gold is carried to the points of their juncture, after which the arm first approached is forced down upon the floor of the filling, the work being again resumed until the junction of the arm on the opposite side is reached; and, that it shall not extend in length beyond the filling when finished, this also is forced on the floor, as in the case of the first. The third extension is permitted to remain in an oblique position, but so directed as to fall within the line of surface of the filling, as it assumes a narrow or wedge-like shape on approaching the cutting edge of the tooth. When restoring along the mesial and distal lineal border of the cavity, care should be observed to prevent horizontal fracture in the central region of the tooth. The strain becoming obviously increased by the repeated blows of the mallet, as it approaches the cutting edge of the tooth, precautionary measures should be adopted to support the enamel by the application of steady force upon the labio-cervical two-thirds. This may be accomplished by the adjustment of a splint made for the purpose, so that the oblique line, or wall of decay, will permit the gold to be substantially packed along its facing surfaces.

In the same mouth (see fig. 5, page 199), the central incisor and the canine are similarly affected, with this exception—that the decay in these teeth advances from the mesial and distal surfaces towards the central portion of the tooth, approximating in a juncture of decay.

The disease has penetrated the pulp chamber in both instances. The remaining sound portion of the tooth on the lingual surface, when dressed, conveys the impression of a septum between the cavities; but the removal of the devitalized pulp forms an interior connection, leaving the septum rather as a support than a division. The extensive undermining of the lingui-cervical portion of the tooth, involving the meso-lingual and disto-lingual points, indicates the propriety of still further associating the septum with the protection of the labial surface. This is effected by carrying the gold over, and completely framing it in. To prevent any projection beyond the original lingual contour, the substance is removed to a depth of about the third of a line, extending to distances marked in the diagram, and tapering so as to connect the cavities without angularity. To be better understood, reference may be made to the following figures.

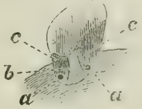

FIG. 25.

a a. Anchorages.
b. Septum.
c c. Labial walls of cavities.

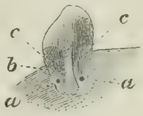

FIG. 26.

a a. Anchorages.
b. Septum.
c c. Labial walls of cavities.

The commencement of the filling is in the anchorage points *a a*, and is continued by building along the inner plate of the labial wall *c c*, until the gold has been carried to a level with the septum; it is then worked over it to preserve the contour of the tooth, part of the septum having been removed as already stated. The treatment of 25 is strictly analogous to that of 26.

In the left lateral (fig. 27). decay had so destroyed the substance of the tooth that the enamel of the labial surface was literally all that remained above the gum. Frail and brittle, it appeared semi-transparent (*a a*), and presented the ragged and uneven edges as shown.

The nerve canal being prepared and filled, on the floor (*b*), two rectangular excavations were formed ; and in each of these depressions, an anchorage was made. These anchorages, combined with the filling of the nerve canal, gave a very strong attachment vertically. To prevent lateral displacement, the feathery edges of the remaining enamel were carefully dressed, reduced slightly in height and width, and then bevelled from the labial to the lingual aspects. The gold, as it rose from the base of the filling, was returned upon the bevel; and, when the operation was completed, and the restoration of the contour of the tooth effected, the plate of the enamel appeared framed with gold on three of its boundaries, as is represented in fig. 28, *c c c*.

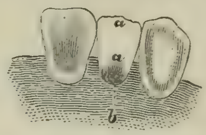

FIG. 27.

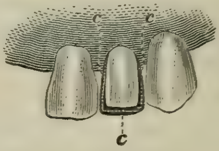

FIG. 28.

FILLING PROXIMAL SURFACES OF TEETH.

WRITING upon this subject in *Items of Interest*, C. A. Marvin, D.D.S., Brooklyn, N. Y., says :—When fillings are inserted in the proximate surfaces of teeth, bicuspids and molars notably—the teeth having been separated for that purpose, if the operations are so done that the teeth are allowed to come together again, tooth-substance touching tooth-substance, a renewal of decay is certain. It matters not whether the point or points of contact be at the cervical walls, the lateral walls, or the grinding-end walls, the result is one. The prevention of decay, in such cases, requires one of two modes of operation, as distinct from each other as the poles. One consists of cutting away so much of the teeth that they cannot get together, and filling the sides so cut with flat fillings. This insures the prevention of renewed decay, but is objected to for several reasons. It breaks up the continuity of the masticating surface. It leaves wide spaces between the teeth for the uncomfortable accumulation of food during eating. It exposes the gum borders to injury from the same exercise. It renders uncertain the continuance of a tooth in the particular position it occupied when it was operated on. It may move forward or backward or rotate till an unsightly effect is produced. It involves a great waste of valuable tooth structure. The other method consists of removing so much of the buccal and lingual walls of the cavity as will allow the swell of the filling to project beyond them laterally when the original ovality of the tooth is restored; and then so finishing it that, when the teeth approach each other, the rounded gold side of one shall touch the rounded gold side of its neighbour, closing the space completely, and allowing no tooth-substance in one to come in contact with any tooth-substance in the other. This method prevents the recurrence of decay, and leaves no ground for the objections before specified. A much higher degree of skill, however, is requisite for the successful performance of such operations, but this fact should work no detriment to men engaged in any scientific pursuit.

In filling the lateral surfaces of these same teeth, where the cavity extends so far towards the end of the tooth that the grinding-end wall is quite thin, and the fissure between the cusps is at all defective, the only certain mode of securing *prevention* is to cut out the fissure to its extremity, cut down the thin end wall of the lateral cavity, and make of both one continuous canal for one knee-shaped solid filling.

AMMONIATED GOLD FOIL.

Dr. BLACK, of Jacksonville, Ill., says : —Ammoniated foil is as soft as any tin. The extra cohesive foil (which condition implies the greatest softness, purity and cleanliness) will become perfectly non-cohesive by a few minutes exposure to ammonia, without in the least impairing its softness. It may easily be ammoniated by placing in a box or drawer, together with a bit of spunk or cotton dampened with spirits of ammonia, and closed for a short time. It may be kept thus in a special box for use. It will become perfectly non-cohesive, so that it will not weld any more than tissue paper will weld, and makes the best cushions for margins that I have yet tried. I place such thickness as I may desire on my margin, and then secure it by placing cohesive gold over it. Whenever we have foil that is not cohesive after annealing, it is because there is something on its surface that heat will not drive off. Phosphorus and sulphur, and perhaps many other things, will accomplish that. Ammoniated foil is easily re-annealed, and then welds perfectly. Many of the things which are liable to make foil perfectly non-cohesive are of an acid nature, and the foil is protected from them by ammonia. All metals are welding metals if clean. Gold does not attract oxygen to its surface, and so is easily welded cold. Platina does attract oxygen and cannot be welded cold, but by covering platina with gold we can get the welding property of the gold and also of the platina beneath it, and they will become a coherent mass under the plugger. Some persons spoil their gold by annealing in a lamp after touching the wick with the phosphorous or sulphur of a match.—*Items of Interest.*

THE RELATION OF DENTISTRY TO MEDICINE.

By Dr. W. W. ALLPORT.

IN the course of an address delivered at the Banquet of the Michigan State Dental Association, on March 31st, 1882, and reported in the *Dental Register*, Dr. Allport said :—To define this relation is not an easy task. The status of law, medicine, and divinity, as well as the various mechanical pursuits, are well defined, not only by those engaged in them, but by the public at large. But this is not the case with what is known as Dentistry. Even those who practice it are not fully settled as to whether it is a mechanical pursuit, a profession by itself, or a department in medicine; and the facts in regard to its practice fully justify this undefined position. If I were asked whether Dentistry was a mechanical business, my reply would be "yes." Or, if the inquiry were whether it constituted a special department in medical practice, I would still answer "yes." If asked whether it were a calling by itself, as many claim, I would also reply "yes"—according to its teaching and practice.

But how, you ask, can the same answer be given to these seemingly contradictory inquiries? To this my reply is, when a man practices what is popularly known as Dentistry, such as removing tartar from the teeth, preparing cavities in teeth and filling them, and making sets of artificial teeth, no matter how well these operations may be performed mechanically, if he is ignorant of the cause of Dental diseases and the medical science essential to their proper treatment, he is a mechanic and nothing more, as a large proportion are. In this case, so-called Dentistry is in no way related to medicine. If, on the other hand, the practitioner is medically educated, is conversant with the cause of the diseases he is called upon to treat, and the relation they bear to associate parts in the manifold reflex action of the teeth upon other portions of the body, and the action of remote organs upon the teeth and their appendages, and if he brings the same intelligence to bear in the treatment of Dental diseases that the opthalomologist brings to bear upon the treatment of the eye, or the surgeon brings to bear upon the treatment of other surgical operations, which many do, then he is a special practitioner in medicine with all that the term implies. In *this* case, Dentistry bears a most intimate relation to medicine.

But if he has sufficient mechanical skill to construct the simpler kinds of mechanical Dentistry reasonably well, and possesses tolerable, or even marked skill in the mechanical manipulation of filling teeth, in what is known as operative Dentistry, and has just enough medical knowledge not to be a physician, then I suppose it would be considered that he belonged to a distinct calling—our glorious Profession.

The anomalous and strange position which our calling occupies at the present time will not be wondered at when we consider its history.

It is said, and generally with truth, that first impressions are the best, and when Dr. Harris was impressed with the idea that the diseases and treatment of the teeth should be taught in medical colleges, and that Dental Surgery should be made a specialty in medical practice, he was undoubtedly correct; and when a medical college refused to establish a chair for that purpose, future progress in Dental science made the establishment of Dental colleges a necessity. Hence, it was not from choice but necessity that our present system of Dental teaching was inaugurated, and it is not impossible that the advance in the science and practice of Dentistry has so far been quite as great under this system of teaching as it would have been had it at *first* been connected with medical colleges; and, under all the circumstances, we most certainly have just cause for congratulation that our Dental colleges have done so much and so well what they have done, for there is no question that the proper practice of Dentistry in its two departments has now become so complicated—the one with mechanics and art, and the other with mechanics and medical science—and the proper practice of each has become so intricate that there are few indeed who possess the natural gifts or could acquire the necessary and varied skill for the proper practice of both; and the further attempt of our Dental colleges to teach both to the same individual, and to make a partial qualification in each essential to graduation, and the subsequent attempt on the part of these graduates to practice both departments only serves to dwarf both.

Proficiency of attainment in these two dissimilar vocations in the time now allotted to their study, is utterly impossible. When properly learned and practised, one should be classed as a mechanical art, the other as a medical specialty.

The proper practice of Dentistry as a distinct calling requires three leading and well-marked natural gifts—mechanical talent, artistic feeling, and the ability to comprehend medical science—three qualities seldom found in the same individual. The first is mechanics; this is required in what is known as mechanical and as operative Dentistry, and without which more than a moderate success in either would not be possible. But from this common ground their lines diverge and they have but little, if anything, in common. In the mechanical or prosthetic part of Dentistry, mechanical talent should be supplemented by the same gifts which would either make a sculptor or a painter; and these gifts should be cultivated by art-studies rather than the medical studies essential for the Dental Surgeon.

Artificial dentures have three uses: mastication, aids to speech, and artistic or natural appearance in the mouth. Their fit and usefulness depends entirely upon a knowledge of the principles of mechanics and their correct application. A proper construction of artificial dentures so as to aid speech, involves a knowledge of anatomy and the action of the vocal organs, a lack of which knowledge will explain the reason that so many sets of teeth are impediments instead of aids to speech. Their natural appearance in the mouth depends entirely upon the application of principles of art, which are distinct from Dental Surgery.

Proficiency, therefore, in prosthetic Dentistry requires study and skill far too great to be coupled with or tacked on to the tail of any department of medicine, the attempt to do which has rendered it simply as a mechanical business almost a disgrace; and I will venture the assertion that there is not at the present time, as generally practised, a class of mechanical business so poorly followed, or that falls so far short of its possibilities as that known as mechanical Dentistry. I will not except ready-made clothing or boots and shoes.

Now, we all know that for full sets of teeth there is nothing that will compare with what is known as continuous gum teeth, and of the 12,000 Dentists in the United States, there are not 200 who can do this style of work properly, or even acceptably—and I doubt if there are 100. And there are not 1,000 who can creditably meet the various requirements of full and partial cases on gold plate. And yet, we all know that when these two kinds of work are properly done they are far superior, in most cases, to rubber or celluloid. Nor is this condition of things to be wondered at when we remember the skill that is required in putting up this better class of work, and the time and attention that is given to learn it.

Why, Mr. President, a man cannot learn to put up good gold or continuous gum work, even mechanically, to say nothing of its art, in less than two years, and he may do nothing else. But when is added to the mechanical part the selection and arrangement of teeth in the mouth to give a natural appearance, though he may possess an artistic gift, three years is as little time as should be devoted to learning it; and it is utterly impossible for any considerable number to learn the details and acquire skill in mechanical Dentistry, and at the same time gain such a knowledge of medicine and acquire such skill in the treatment of Dental diseases as will make them proper practitioners of Dental Surgery in the time usually devoted to it in the accepted mode of teaching.

For the credit of ourselves, as well as for the best interests of the public, this way of things should cease. But it never will so long as it is taught in its present manner.

There is enough in it to engage the entire time and attention of the finest mechanical and artistic talent, and it will never be elevated to its true position until it is learned and practised as a distinct mechanical art uncomplicated with medicine.

On the other hand, the proper treatment of Dental diseases requires a knowledge of medicine equal to the general practitioner, to which should be added such special knowledge as would make the Dental surgeon an authority worthy to be taken into consultation with medical men in all diseases, either directly or remotely connected with the teeth; which would, of course, include sufficient knowledge to prescribe for all constitutional or local conditions that affect these organs. To this should be added such training as would make him a skilled manipulator in operations upon the teeth, or associate parts. To obtain such knowledge and acquire such skill, even to a reasonable degree, in the time now allotted by our Dental colleges, and at the same time to become respectable manipulators in the various kinds of mechanical Dentistry, is simply impossible. And it will never be elevated to its proper position as a special department in medical practice until its teaching and practice is uncomplicated with mechanical Dentistry.

With this statement, the practical question that confronts us is what change should be made in Dental teaching to meet this exigency? Possibly this problem is not easily solved, but I will state what seems to me to be desirable. In the first place, I would require all Dental surgeons to be medically educated; and I would have physicians so educated as to Dental diseases that they would be as intelligent upon these matters as they are in regard to other diseases. To this end I would establish chairs upon diseases of the teeth in all medical colleges, and all entering students should matriculate as medical students, thus making a knowledge of the diseases of the teeth and the science of their treatment as essential to graduation as a knowledge in any other department of medicine—graduating upon the same footing. For the practical teaching of mechanical Dentistry, as well as the practical application of medical science in the treatment of Dental diseases, I would have an infirmary. In this infirmary I would have a department for the teaching of mechanical or prosthetic Dentistry under the direction of one or more competent mechanical Dentists, who would give instructions in all that related to that practice.

The students in this department should be required to attend such lectures as would make them familiar with the anatomy of the parts about which they work, as well as such lectures upon chemistry and art as would be applicable in their practice, and they should receive certificates of qualification on becoming sufficiently skilled in their calling to engage in the practice of mechanical Dentistry only. In this infirmary there should be a department for didactic and clinical instruction for those proposing to become Dental Surgeons; which department, of course, should be under the direction of the most competent Dental Surgeons in the country—as clinical surgery is taught by the most experienced teachers and practitioners of surgery, rather than by young and inexperienced Dentists, as is now too often the case in our Dental colleges. But in no case should they receive certificates of qualification to practice without a medical degree. For the present, or until the people had become educated to the idea that mechanical Dentistry could be more properly done by those who follow it as an exclusive business, it might be well to make it optional for those who propose to practice Dental Surgery to receive instruction in mechanical Dentistry; and to give them a certificate of qualification for exactly what they were competent to do.

If they were competent to put up work on gold or platina, let it be so stated; and if they were only competent to put up work on rubber and celluloid, make a statement in exact accordance with these facts. But in no way make the qualification to practice in mechanical Dentistry requisite to a certificate to practice in Dental and Oral Surgery.

In this way mechanical Dentistry would be elevated to a position of great usefulness and respectability. But it should not, nor could not, in any way be regarded as a department in medicine, or in any way related to its practice, any more than is the making of artificial limbs, or sculpture, or painting.

In this way, I should in a few years expect to see our practice permanently divided, and prosthetic Dentistry developed into a high mechanical and artistic calling, and the relation between Dental Surgery and the other specialties, as well as the general practice of medicine, grow into a more proper and intimate relation.

In this way only, Mr. President, would the natural relation between Dental Surgery and medicine and mechanical Dentistry and its kindred arts be developed and maintained; and it is to be hoped that the time is not far distant when the Regents of the University of Michigan will see fit to inaugurate this or some similar system of teaching. For we want no more eye doctors, tooth doctors or bone setters, but physicians, to treat the diseases of God's temple—the human organism.

HIGHER DENTAL EDUCATION.

WRITING on this subject, Louis Ottofy, D.D.S., in the *Dental Cosmos*, says:—With the rapid advance of Dental science a great difficulty is experienced in regard to the education of the new members who enter the ranks of the Profession. The fact is that a higher education is required than that which is now obtained. But how can students obtain the required education, with the limited time and means at the command of the majority of them? It is very easy for one who has ample means and time to get his A.M., M.D., and D.D.S.; but seven-eighths of the students have not the means, and cannot spare the time. Some have managed to labour awhile without college education, and gained the means wherewith they could struggle through the prescribed Dental curriculum and obtain the D.D.S. Some have even gone further, and obtained the M.D. Then they argue that no man ought to enter our ranks without the degree of

M.D., or at least D.D.S., forgetting that they have earned these honours with the means gained within the ranks.

At present those who can afford it take a college course of two or three sessions, as the case may be, but these are only a fraction of those who enter the ranks; the majority come from a preceptor or without any previous education. I suggest the following plan:—

Let the curriculum remain as it is. Let the student attend two or three courses of lectures, clinics, etc., as at present. Let the teaching be progressive, and include only the most practical parts of a Dentist's duties, and only so much of theory as is necessary to make the practical teachings understood. At the end of these terms let students pass an examination substantially the same as at present, but instead of graduating them to the full degree of D.D.S., D.M.D., or M.D. semi-graduate them, if you please, with a simple certificate, a B.D.S. (Bachelor of Dental Surgery), a D.M.B. (Bachelor of Dental Medicine), or an M.B. (Bachelor of Medicine), and let it be understood that either of them is simply a certificate which recommends its owner to that extent to the confidence of the public. Let it also be understood that the education is not yet finished, but that if the student pursues the study for three or five years more, and if, at the end of that time, he can pass a thorough examination, he can receive the degree of D.D.S., D.M.D., or M.D., as the case may be. Let all fees be paid as at present—that is, at the first or (as in this case it would be) the semi-graduation, including the fee for the degree which he is expected to get within three or five years. Thus the education which the candidate has obtained becomes a money consideration; but he is entitled to a degree which he can obtain only by merit, and not otherwise. The opportunities for study for young practitioners are numerous and varied; the most of them, if they have their degrees, do not take advantage of them; but if one is expected to pass a subsequent examination, he will and must improve.

Thus the study of Dentistry can be extended over a period of from five to seven years. In that length of time any one with the required ability and a common school education can become a Dentist.

There is a great deal which it is very useful for a Dentist to know, but which is not essential, especially in the first year or two of practice, though the gain of this knowledge will most assuredly help one to become a successful practitioner.

AMERICAN STATE DENTAL EXAMINERS.

A St. Louis D.D.S. writes to the *Missouri Dental Journal* on this subject, and says:—I would like to ask how the members of the State Dental Examining Boards are selected. I make the inquiry because I recently had under my care a case that came but a short time ago from the hands of a member of the State Board of one of the Western States. I will describe what I found: A lower sixth-year molar, which had been sometime painful, had been treated with arsenical paste, the pulp destroyed, and a large amalgam filling inserted. At the cervical border of the cavity, the amalgam projected towards the second bicuspid more than one-sixteenth of an inch, but not quite one line, by actual measurement. On removing the amalgam I found four root canals, one of which had been rather loosely filled with cotton, and the other three unfilled. There had apparently been little or no preparation of the cavity of decay with reference to retaining a filling, but the amalgam was anchored into the pulp cavity, and by this means held in place. The filling was leaking badly, as much as half-way round. The adjoining bicuspid was quite as badly decayed as the molar, and ached immediately after the molar was filled, but nothing was said to the patient about this tooth.

A deciduous molar on the opposite side of the mouth with dead pulp had also been filled, and the amalgam was finally packed against the adjoining permanent molar. The root canals were also unfilled. This person was twenty-one years of age.

Now, Mr. Editor, if this case had come from the hands of a mere private practitioner, I should not have troubled you with this description of the work, but when a man has been chosen as a public officer, and it is his duty to examine applicants who wish to practice in his State under the law, I think his qualifications are open to criticism by the Profession at large. There was a lack of the exercise of proper skill; yet, if he possessed the skill and did not use it, the matter is just as bad.

THE EDITOR REPLIES,—In some States the Examining Boards are chosen by the Governor of the State; in other States the State Dental Societies elect or have the right either to nominate or to confirm the appointments made by the Governor.

We have always opposed that feature in Dental legislation which provides the machinery of an Examining Board, and we have been equally averse to the provision which recognises a medical degree as a sufficient qualification for the practice of Dentistry. Every Dentist knows that a medical degree, *per se*, does not qualify its holder for the practice of Dentistry, and, therefore, it seems clear that the law should not so provide. It opens the door for young medical graduates, who do not succeed in medicine, to enter upon the practice of Dentistry with little or no knowledge of distinctive Dental science, and little or no skill in Dental art.

Examining Boards are designed chiefly for the examination of practitioners who hold no degree, but who wish to move into some given State, and to obtain lawful authority to practice therein. The number of such applicants is undoubtedly small, and it would be no great hardship to require all such to attend a course of Dental lectures, and to obtain a Dental degree; or, declining to do this, to remain in their respective States, or to go into a State where no legal restriction exists.

Another important duty which devolves upon Examining Boards in some States, is to determine the standing of Dental Colleges, and to decide whether their diplomas shall be recognised or not. One objection to the lodging of this power in the Examining Boards is, that there is no uniform standard established as yet to guide their decisions, and each Board is therefore obliged to provide one of its own. The liability to a want of uniformity between the different States is apparent. Another objection is, that unless the members of the Board take nothing from hearsay, but visit the colleges and become familiar with their methods, and the examination standard of each school, they are liable, unwittingly, to make unjust discriminations, and to fail to give credit where credit is due.

The authority to determine the credibility of colleges is eminently right and proper, the only question being as to the manner of its exercise. This is a point we should like to hear discussed, for it is of great importance that a question of so much magnitude should be rightly determined. Under existing conditions the diplomas of a college may be good in one State and not in another; or they may be recognised by a State Board at one time, and rejected at another, when the membership of the Board has changed. Our present view is, that a Dental College Association for the United States should be formed, and that the authority in question should be exercised by that body. That there is need of a concert of action by the Dental Colleges seems evident, and this appears to us to be one of the points upon which it should take action. But the question is an open one, and it is probable other and perhaps better methods may be proposed.

If laws regulating the practice of Dentistry provided that all newcomers should hold the Dental degree, and if the status of the colleges was determined by a College Association, the whole matter would be greatly simplified, and the necessity for Examining Boards, which are both inconvenient and expensive, would no longer exist.

LEECHES UNSAFE.

A VERY singular case of death from poison communicated by a leech has recently occurred at Berne, Switzerland, and under circumstances which the medical gentlemen there, are at present unable to explain. An individual residing in the town had been suffering for a few days from sharp attacks of toothache; to alleviate the pain his

Dentist recommended him to apply a leech to his swollen gums. The remedy appeared to be simple, and the patient on his way home, bought a leech at the chemist's shop, which he applied as directed, at once. Two hours later he felt himself unwell, and remarked that his lips were somewhat swollen, the cheek, neck, and chest becoming equally so toward night. He neglected to seek medical assistance until the following morning, and this delay proved fatal. When the doctor was at length called in, the patient's head was much inflamed, his breath was laboured, delirium ensued, and in twenty-four hours he expired. The post-mortem examination made by experienced doctors revealed the fact that the cause of death was blood poisoning, which was traced to the moment when the leech was applied to the gums. It was evident that the blood-sucker had communicated a poison which had rapidly spread through the whole system; but a point which remains to be cleared up is, how the leech, which had been several days at the chemist's when the deceased purchased it, could have become a medium for transmitting this virulent poison.—*Exchange*, and the *Missouri Dental Journal.*

EXTRACTION OF TEETH IN PREGNANT WOMEN.

At a recent meeting of the St. Louis Medical Society this subject was under discussion. Dr. Borck asked, Is it advisable to allow the extraction of a tooth or of teeth in a woman who is pregnant? I have been several times asked this question by Dentists. Some eminent Dentists are afraid to extract an aching tooth in a pregnant woman, lest it may cause abortion.

Dr. Green said that it does not necessarily produce abortion. Of course, there may be cases where such an effect would follow, but if the woman is suffering, and cannot be relieved by any other means, he would recommend the extraction of the tooth.

Dr. McPheeters said that there is a form of toothache which is sometimes a symptom of pregnancy. The teeth are sound, and, of course, it would do no good to extract them. He would not hesitate to advise the extraction of a carious tooth.

Dr. Hughes said, some patients, when pregnant, are extremely hyperesthetic; the hyperesthesia extends to the branches of the fifth pair. Other women, who are more or less nervous when not carrying a child, seem to possess more nerve then than at any other time. I do not know, in view of the varying and variable physiological condition in which we find women in the pregnant state, that we could arrive at any definite rule applicable to all cases. It is simply a question of individual temperaments, of condition of the patient, and of the existence of centric or eccentric irritation; the existence or non-existence of central or peripheral irritation. And, if a pregnant woman is extremely hyperesthetic, and you can find a focus of origin for it in the peripheral irritation of a decayed tooth, there would be no impropriety, in the majority of cases, I apprehend, in the removal of that decayed tooth. If in a condition of general nervous excitation, especially if centered in the brain or cord you have any form of spasmodic display, and you find a possible peripheral source of the irritation, I think the general sentiment of the Profession would concur in the propriety of removing that possible source of peripheral irritation.

Dr. JONASTON said, some years ago I was called to a lady who had been married six or eight weeks. The second left molar was decayed and an abscess was forming, and protruded from the root of the tooth. The abscess was painful, and I advised opening it. She consented, and I took my lancet and opened the abscess. This produced a tremendous shock, and in 24 hours she aborted. This case occurring in my early practice has made me very careful about extracting a tooth from a patient during the early part of pregnancy if she be of a nervous temperament; it is hazardous practice. But if the toothache continues, the reflex irritation of the pneumogastric nerve, connecting with the great sympathetic, may induce uterine contraction, and cause the woman to abort. In such a case we should recommend that the tooth be pulled. There is no rule in the practice of medicine; and no rule as regards drugs, except castor oil. I have given calomel for 20 years, under the supposition that it acted on the liver, and now we are told that it doesn't act upon the liver at all.

Dr. HURT closed the discussion by saying, I think we are all obliged to concede the possibility of the extraction of a tooth during pregnancy producing abortion under certain conditions. There is no doubt, also, that there are circumstances under which the extraction of a tooth during pregnancy ought to be advised. The loss of a sound tooth ought not to be allowed, unless something is going to be accomplished by it that cannot be accomplished otherwise. But I would have no hesitation about advising the extraction of a tooth from a pregnant woman if it was absolutely necessary to relieve her from a distressing, harrassing pain that was wearing her out; and in doing this we may administer an anesthetic without interfering in the least with the pregnancy. When she is under chloroform or ether we obviate the shock which is usually attendant upon the extraction of teeth. And experience has taught that pregnant women are very tolerant of these agents.—The *Dental Cosmos*, from *Medical and Surgical Reporter*.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE ordinary monthly meeting of this Society was held at 40, Leicester Square, on Monday, May the 1st inst., SAMUEL LEE RYMER, Esq., President, in the Chair.

The PRESIDENT reminded the members that since their last meeting the world at large had lost an eminent worker in the field of science. Mr. Darwin had passed away at a ripe age, and had left his works as a precious legacy highly valued throughout the world. The Council had deputed him to propose to the Society the following resolution :—

"That the Odontological Society deeply regrets the loss sustained by the death of Mr. Charles Robert Darwin, whose eminent scientific labours deserves the deep gratitude of all those interested in the progress of knowledge, and that the deepest sympathy of the Society be conveyed to the widow and family of Mr. Darwin in their bereavement."

The resolution was carried unanimously.

Mr. SEWILL showed three specimens—the first, a lower molar, with a well pronounced third root, extracted from a boy with a very small jaw. The second specimen was an upper molar, having a mass of dentinal tissue round it which, Mr. Sewill said, seemed to possess some of the characters of an Odontome. He also showed the lower first molar of a boy aged six, having a large cavity in the posterior surface into which part of the crown of the second molar had fallen. Mr. Sewill extracted the first molar, and the second came out with it. This he at once replaced, the tooth soon became firm, and no harm appeared to have resulted. This was the third accident of the kind that had occurred in his practice. He had mentioned the matter before the Society some years ago. Mr. Sewill next alluded to the use of absolute alcohol for drying cavities. Of late he had used ordinary strong rectified spirit, instead of absolute alcohol, and found that it answered the purpose very well, and that it had the advantage of not blistering the lips and tongue if they were accidentally touched by it. Mr. Sewill was also desirous of ascertaining the opinions of members upon the question, was it wise to extract the teeth of pregnant women ? Such patients were constantly coming for advice and to be relieved of pain, but when extraction was proposed, one was met with the answer that the patient's doctor did not consider it would be safe for her to undergo the operation in her present condition ; so the patient continued to suffer, and her strength was reduced by the pain. Medical practitioners generally said that teeth should not be extracted under such conditions ; but he thought that in young healthy women, and in an early stage of pregnancy, nitrous oxide gas should be given, not chloroform, because of the sickness, and the teeth extracted. Even if the patient was weak and nervous, he believed that the slight shock of the operation did less harm than the exhaustion produced by long continued pain ; and in most cases he believed extraction did no harm.

The PRESIDENT having made some remarks,

Mr. CHARTERS WHITE said that the accident of extracting two teeth instead of one had occurred four times in his practice. In each case the left lower second bicuspid had come out with the left lower first molar; the latter being the tooth he intended to extract. He had always replaced the bicuspid at once, securing it temporarily with a silk ligature, and the cases had all done well.

Mr. COLEMAN said the accident would have occurred many a time with him if he had not observed the tooth move, and taken necessary precautions.

Mr. S. J. HUTCHINSON asked Mr. White and Mr. Sewill if they thought that the teeth which they had replanted had maintained their vitality?

Mr. CHARTERS WHITE replied that it was a difficult matter to determine what the condition of the pulp might be, but that so far as colour and sensibility went he had every reason to believe that it was completely restored. After some observations by the PRESIDENT and Mr. F. J. BENNETT, Mr. SEWILL in reply said that he could not be certain that the pulp vessels had re-united, indeed he thought it more likely that they had not; but there could be no doubt that the periosteal vessels had re-united, and these appeared to be quite sufficient to maintain the vitality of the tooth.

With reference to the use of alcohol, Mr. CHARLES WHITE and Mr. COLEMAN, having spoken of its volatility and affinity for water, Mr. STOCKEN said that he had found alcohol a very useful application to cavities and to root canals; instead, however, of using absolute alcohol, he mixed ordinary rectified spirit with carbonate of potash. The potash abstracted the water from the spirit, and although the result was not absolute alcohol it would be found quite strong enough for this purpose.

With regard to the question of extracting teeth during pregnancy, Mr. F. CANTON said he had frequently been asked as to the advisability of such operation, and never hesitated to answer in the affirmative. He always preferred to give gas in such cases, and he took care to give it thoroughly. Under these conditions he had never seen any harm result.

Mr. COLEMAN remarked that he never hesitated to operate in such cases when an operation was really necessary. Long continued pain might of itself produce a miscarriage, and the shock of an operation performed without gas might in some patients have the same effect.

He therefore thought it best always to give gas, and remove the teeth.

Mr. F. H. Weiss said it was a question whether maternal shock was not likely to produce some of the deformities with which some children were born. It would also be instructive to know if there were any particular time for these deformities to take place.

Mr. Stocken said he had been assured by an eminent accoucheur that there was no danger of producing deformity in the child after the mother had passed the period of quickening.

Mr. Lloyd Williams mentioned a case in which a patient was prematurely confined a day or two after an extraction under gas; and it was the belief of the patient that the gas was the cause of the miscarriage. The operation had been perfectly painless.

Mr. Sewill in reply said that such an accident was possibly due not to the operation but to the antecedent nervous disturbance, and to the patient's neglect in not applying for advice sooner.

Mr. W. F. Henry showed a model of the mouth of a child eight years of age, in which the lower incisor teeth impinged upon the lingual aspect of the necks of the upper incisors, causing the latter to project forwards in a most objectionable and unsightly manner. The patient was a most troublesome and refractory child, and he thought the best thing to do under the circumstances would be to cut off part of the crowns of the lower incisors, extract the upper canines, and then draw in the upper incisors. He would be glad to hear the opinions of members on the subject.

Mr. Steele described a plan of treating such cases which he had followed with very satisfactory results. He made a gold or vulcanite plate for the lower incisors to strike against, and so raise the bite that when the jaws are closed the molars are clear of each other. The tendency of teeth being to advance if they have no antagonists, it would be found at the end of three months that the space between the molars would have disappeared, and that they would meet even when the plate is in position; and that when the plate is removed the lower incisors no longer strike upon the upper ones. These latter must now be drawn back.

Mr. S. J. Hutchinson thought that if Mr. Henry would wait until the child was twelve years old, and the permanent molars were in position, he would find that the deformity would by that time have become much less marked. He might then remove the first bicuspids and draw back the incisors.

Mr. Henry said he was very much obliged to Mr. Steele for his hints and suggestions, and should certainly be disposed to try the plan, though he feared he should not be able to get his unruly patient to wear the plate for any length of time. As for Mr. Hutchinson's suggestion that nothing should be done until the patient was twelve years old, that was out of the question. The case had been getting rapidly worse during the last eighteen months, and he had no expectation of any improvement except as the result of treatment. He should feel more confidence in cutting off part of the lower incisors, at the same time extracting the temporary canines, to give the superior incisors an opportunity of returning to their place by the aid of the muscles of the mouth.

Mr. STEELE then read his paper on "The Connection between Mechanical Injury and Caries of the Teeth."

The influence of mechanical injury of the teeth as a cause of caries, although mentioned by several writers, had not received the attention which its importance required. Various chemical and vital theories had been put forward and fully described, but without denying the importance of chemical and physiological changes, he believed that mechanical injury was the most frequent and most direct cause of the mischief. The generally received opinion was that the exciting cause of caries was an acid condition of the fluids of the mouth, producing decomposition of the earthy salts which entered so largely into the composition of the enamel and the dentine. Some authorities held that enamel was not liable to caries, and it seemed probable that so long as it remained perfect it would serve to protect the dentine also from the ravages of this disease. But the enamel was so liable to injury from various causes, and at so early an age, that it was rare to find teeth in which this structure was not more or less damaged, though not always so much so as to render it useless as a protective armour. If, then, the enamel should happen to be imperfect, whether from congenital deficiency, or as the result of concussion, or from being unfairly used, the acid fluid would obtain access to the underlying dentine, and serious results would follow. The practical deduction from this view of the subject was that more pains should be taken to impress, especially upon young people, the importance of not abusing their teeth. They should be assured that in subjecting these organs, which appear to them so hard and strong, to all sorts of rough treatment, they are laying up for themselves serious trouble in the future. He felt sure that the spread of a better knowledge of the evils of maltreatment, and the consequent exercise of greater care would be followed by a perceptible diminution in the ravages of Dental caries.

After some observations from the President, Mr. CHARTERS WHITE said he thought the division of the causes of Dental caries into mechanical, chemical, and physiological was a correct one, and of these the first mentioned was a very frequent cause.

Mr. F. H. WEISS showed a second upper bicuspid which he found was split along two-thirds of its length, yet the patient was not aware of any mechanical injury to the tooth.

Mr. Stocken mentioned a similar case, and inquired if any of the members had noticed any harm to the teeth and gums arising from the use of Floriline. His observations had led him to discourage the use of the nostrum.

Mr. Steele having replied, the meeting adjourned.

EASTERN COUNTIES' DENTAL ASSOCIATION.

The first annual meeting of the members of this Association was held on Wednesday, April 26th, 1882, at the Norfolk Hotel, Norwich. There were present—Messrs. R. White, L.D.S.Eng., Norwich (president); R. W. White, M.R.C.S., L.D.S.Eng., Norwich; H. W. Tracy, L.D.S.Edin., Bury St. Edmund's; J. J. Musgrave, L.D.S. Glas., Lincoln; J. B. Bridgman, Norwich (treasurer); B. W. Harcourt, Norwich; G. Cunningham, D.M.D.Harv., Cambridge; Francis Boulger, Norwich; W. A. Rhodes, Cambridge; W. Marsh, L.D.S.Glas., Colchester; A. L. Littleboy, Norwich; W. Stringfield, L.D.S.I., Lowestoft (secretary); J. F. Cole, L.D.S.Eng., Ipswich; A. Jones, Cambridge; and F. Hall, Hertford. Among the visitors were—Dr. Hills, Norfolk Asylum; E. Saunders, Esq., F.R.C.S., and James Parkinson, Esq., L.D.S.Eng., London.

This Association embraces an area of nine counties, viz., Norfolk, Suffolk, Cambridgeshire, Essex, Lincolnshire, Northamptonshire, Huntingdonshire, Hertfordshire, and Bedfordshire.

The Secretary read the resolutions adopted and the bye-laws framed at the meeting when the Association was formed. All the resolutions and bye-laws as originally framed were confirmed. There was considerable discussion on Bye-law 1 which runs as follows:—

A person registered in the Dentists' Register shall be eligible for election as a member of this Association provided he be of good character, that he does not conduct his practice by means of the exhibition of Dental specimens, appliances, or apparatus, in an open shop, or in a window, or in a show-case exposed to public inspection; or by means of public advertisements or circulars describing modes of practice, or patented or secret processes; or by the publication of his scale of professional charges; or by the assumption of any title, degree, or diploma not recognised by this Association.

Mr. Parkinson was of opinion that it was advisable to make the laws as elastic as possible. To avoid difficulties in future the clause relating to title and degree had better be left out. As election would be by ballot it would be easy to keep out of the Association any objectionable person.

Mr. R. White said the bye-law was not in accordance with the rule of the British Dental Association. Would any difficulty arise through that bye-law if this Association were proposed to be affiliated to the British Dental Association?

The SECRETARY said that when the time arrived for affiliating themselves with the British Dental Association the rules of this Association would be subservient to those of the British Dental Association.

Mr. PARKINSON asked whether it was not possible to affiliate this Association at once to the British Dental Association. This Association would then be governed by its own laws.

Mr. R. W. WHITE asked if the bye-laws of the Midland and Western Counties' Dental Associations were the same as those of the British Dental Association?

Mr. PARKINSON replied that the Western Counties had not the clause this Association proposed to adopt.

Mr. BRIDGMAN explained that it was thought the adoption of this rule would avoid the unpleasantness of blackballing, by preventing certain men making application for membership.

Mr. WHITE said that it had always been intended to affiliate this Association, when established, to the British Dental Association, and this he desired to see accomplished as quickly as possible. But there were great objections to the expunging of the bye-law in question, unanimously adopted, as it was, by a former meeting. If they retained that bye-law he did not see how it should prevent the affiliation of this Association to the British Dental Association. No doubt it would be a great disadvantage to this Association if it were prevented becoming a branch of the British Dental Association, because their members being few they could do little, and would be deprived of advantages which other branches enjoyed. For these reasons he was desirous of so arranging the bye-laws that this Association might quickly be made a branch of the British Dental Association.

Mr. PARKINSON said as a branch of the British Dental Association the Association would have no further expense in relation to the publication of their "Proceedings."

Mr. CUNNINGHAM asked why they should not take advantage of the experience of the Western Counties' Dental Association and get at once the full benefit of affiliation with the British Dental Association? In doing so they would set a good example. But if there was a prospect that by delay they would get a considerable accession of members, then it would be politic to wait before becoming a branch of the British Dental Association. But it seemed to him that the best men in the Profession in the Eastern Counties were already with them.

Mr. PARKINSON, in answer to questions, said that one difficulty the Association would experience by adopting this bye-law would be that it would have to state what degree, title, or diploma they did recognise. But the bye-law would not militate against the Association becoming a branch of the British Dental Association.

Mr. WHITE in that case saw no reason why the bye-law should not be retained. It would be open to the Society to rescind it at any time.

The bye-law was then confirmed.

Mr. JONES, of Cambridge, then proposed that Mr. White, of Norwich, be President of the Eastern Counties' Dental Association for the ensuing year. The more he saw of Mr. White the better he liked him, and he was sure no more competent gentleman could be found to fill the position of President.

Mr. B. W. HARCOURT, of Norwich, who seconded the motion, also expressed his belief that no more fitting man than Mr. White could be found for the office.

The resolution was unanimously agreed to.

The President thanked the members of the Association for the honour they had conferred upon him.

The following gentlemen were elected members of the Council:—Mr. R. W. White (Norwich), Mr. J. F. Cole (Ipswich), Mr. W. Marsh (Colchester), Mr. Musgrave (Lincoln), Mr. G. Cunningham (Cambridge), Mr. Jones (Cambridge), Mr. Harcourt (Norwich), Mr. F. Hall (Hertford), and Mr. N. Tracy (Ipswich).

Mr. Bridgman's appointment as Treasurer was unanimously confirmed, as also was that of Mr. Stringfield, as Secretary.

Mr. Cole, of Ipswich, was nominated President for 1883, and Ipswich was fixed as the place for the next Annual Meeting.

The SECRETARY then read the first annual report which was as follows:—

It is now just twelve months ago, or nearly so, that Mr. James S. Turner, the indefatigable hon. secretary to the British Dental Association, suggested to me the idea of forming a branch of that Institution in the Eastern Counties, upon which I wrote to our now worthy President stating the suggestion and requesting him as one of, if not the oldest member the Profession has in these parts, to take upon him the initiative and to institute a meeting for the purpose of discussing and deciding how far it might be practicable and political to establish such an association.

Most present this day are individually acquainted with the course adopted, but it may be as well to mention that Mr. White communicated with twenty-one gentlemen for their opinions, and from the majority received replies in favour of the formation of a Dental Association, with promises of support.

The meeting of the 5th October last was then convened at which it was determined that this Association should be formed, but for the present to be independent of the British Dental Association, and although some may be disposed to regret this, the resolution was felt to be necessary, for had we attached ourselves it would have been required of all our members to have become members of that Association previous to their election to ours, whereas some in the Eastern Counties, to whom we looked for support in the first instance, were not so, and I believe one or two remain in that position at the present. At the same meeting the President elect (now President) was nominated, together with the Treasurer, Provisional Council, and Secretary, and the resolutions and bye-laws framed to be approved by you.

The wide area our district embraces—viz., nine counties—it was hoped would have produced more than twenty-three members, but that, gentlemen, I regret to say is the total number on our books. I believe all have been written to that should be solicited, yet it is possible some I may have overlooked, and therefore take this opportunity of earnestly requesting all members to afford me every information in their power, and to send me the names and addresses of any gentlemen as from time to time come to their knowledge, and who may be eligible for election.

The objects of the Association and the bye-laws as this day confirmed must, I think, commend themselves to all as being framed upon a very liberal basis.

The Council have met three times, first on the 1st February of this year, when two gentlemen were duly elected members, the President elect nominated, and the place of meeting for 1883 proposed, as confirmed by you, and this our first annual meeting arranged for. The second, on the 29th March, when four gentlemen were elected members, and the proceedings of this day finally settled; and the third, this day, when three gentlemen were elected members.

In conclusion, I now beg to submit to you my thanks for the confidence placed in me, in appointing me your Secretary, and I assure you it will always be my endeavour to forward the interests of our Profession to the utmost.

The report was received and adopted.

The PRESIDENT delivered the following address:—

GENTLEMEN,—While, on the one hand, it is a matter of regret to me, that the first Presidency of the Eastern Counties' Dental Association has not been allotted to one better qualified for its various duties, and one who could, with greater judgment, manage the helm of our newly launched bark; on the other hand, I am deeply impressed by the high honour you have conferred upon me, and while asking you to pardon my failings, will endeavour my utmost to shape our course through seas, untroubled by storm or tempest, to the haven we would reach—Success.

The formation of this Association has been a matter of intense interest to me; and with unity of purpose and professional good-fellowship, great results cannot fail to attend this day's gathering, for although few in number now, we shall, I trust, be enabled, ere many months are past, to attract all members of the Profession to our standard, who are desirous of placing our calling in a better position than it has hitherto enjoyed.

Gentlemen,—First let me assure you it affords me much pleasure to heartily welcome you to this our ancient city—one containing much of interest to Englishmen in general—but I think to those of East Anglia in particular. It is a place, as you are aware, of great antiquity, having been of considerable importance prior to the Roman occupation, and since the Conquest, it has suffered but little from the injurious influences of the civil wars of this country.

But to return to our immediate undertaking, I consider we have much subject for congratulation in the success that has so far attended our efforts in the establishment of this Association; for many obstacles have occurred to retard the work. Although we have an extensive field, the members of our Profession are scattered far apart, and those eligible, who would wish to join us, are few in number. Yet it is gratifying to know we have those amongst us, who will be able and are willing, to give that interest to our meetings, by their contributions and discussions, which I have reason to think will ensure permanent success. And further, too, that professional friendships may commence, and a general knowledge of each other ensue, that may tend to remove much that has been the subject of regret to many of us in years gone by.

It is customary, I believe, in most learned societies, for the annual address from the chair to be partly *retrospective*, partly *prospective*, the former portion reviewing briefly the Society's transactions during the year just concluded, and passing decorous encomia on members removed by the hand of Time. The latter portion mapping out new fields of action, and encouraging the seekers after truth in their contest with disease while endeavouring to wrest from Nature the secrets carefully guarded in her bosom for so many centuries, and revealed only to those who mount step by step, with enduring courage, the ladder of discovery.

The retrospect possible for me, and which I propose briefly to survey, is the progress of Dentistry during the past fifty years, during *four decades* of which it has been my humble lot to be in practice in this city. The prospect I shall offer to your gaze, will be the *future* of Dentistry as an art. This vision must be founded alone upon a comparison with the healing art, of which Oral Surgery is, in reality, an offshoot.

Briefly—we may compare our Profession, at the present time, with the Medical Profession, shortly after the commencement of the nineteenth century—when physicians, surgeons (the descendants of the barber surgeons) and apothecaries, became transformed from heterogeneous classes into a homogeneous profession, recognising only as *subdivisions*—physicians, surgeons, and general practitioners. What apothecary of a hundred years ago could have forseen the improved status of his calling which it now obtains? And to what causes must we attribute this glorious issue? Surely to a frank recognition of common interests—amalgamation, State protection, consolidation, and the striving for the common weal! The contemplation of three quarters of a century hence offers to us as promising a picture. We recognise the interests we have in common, we are amalgamating by means of the formation of the British Dental Association and its branches. We have State protection, to which I shall again allude. Time will consolidate us. Let us, then, all strive for the common weal! It is interesting to us and possibly advantageous, though at times we must confess it stirs up saddened feelings to look back to the period when the first Cartwright, the elder Parkinsons, Thomas Bell, Nasmyth (of London), Roberts (of Birmingham), Henry Woodcock, of this city, and others, were in high repute as practitioners in Dental Surgery.

"Lives of great men all remind us,
We can make our own sublime,
And departing leave behind us
Footprints on the sands of time."

Much have we to thank them for in this our day—for they were good pioneers in our work, and we cannot fail to see, and ought to acknowledge, how much we are indebted to them for the position that Dental Surgery now occupies.

When we consider how much they accomplished with such rude appliances as the Dentists of that day possessed, we must indeed feel that they are fully entitled to a high position on the roll of our Profession. In these days so much has been done for us by the invention of instruments, that operations which, in the infancy of Dentistry, were performed with difficulty, are now managed with comparative ease, rapidity, and precision. And what has brought about this altered state of things? Two grand agencies. The marvellous activity, mental and physical, of our American brethren, and the efforts of the great leaders of the Dental world in this country to elevate the calling to a Profession, and have it recognised as such.

It is most interesting to review the progress made in the art by our friends on the other side of the Atlantic, and I cannot but think their establishing Dental Associations similar to *this*, we to-day inaugurate, tended more than anything else, to the marvellously rapid progress of Dentistry in that country. Minds met and exchanged views—brotherly fellowship sprang up, and the great desire to impart, as well as receive, the results of individual experience, was the grand feature of these periodical meetings. Their papers and communications were eminently of a practical nature, and if not, as a rule, rising to the position of such as are discussed in more learned societies, were productive of information of a useful character, and encouraged those who had no pretensions to be considered highly scientific, to bring forward the practical results of careful work in the manipulations appertaining to their calling.

This was their great element of success, and from it arose that development of the art which has done so much to make American Dentistry occupy the position it does, and which Englishmen have been so willing to take advantage of and adopt.

Those who have watched that onward march of Dentistry during the last forty years in America, must have come to the conclusion that the successful position American Dentistry has reached, has been obtained by *thoroughness*. Thoroughness in every operation—nothing carelessly done or half done—when a mouth required treatment, whether it was the correction of irregularity of denture, the stopping of carious teeth, or the insertion of artificial ones, every operation was carried out "thoroughly." Conservative treatment was, and is, their aim, and with them a most important consideration, and claims their first attention. A painful tooth is brought under treatment; no hasty extraction to be replaced by an artificial substitute, but it is subjected to proper remedial measures. If the pain should arise from inflammation of the dental tissues—that is first subdued before anything else is attempted. Should suppuration of the pulp be going on—the pulp is removed—the canal in each root is thoroughly cleansed and plugged before the cavity in the crown is filled. This operation is then performed with great care, and a filling nearly approaching perfection is introduced. There is no apology for a stopping operation which, in a few months or perhaps weeks, would require further attention—or a stopping at once injudiciously inserted, which in a few days might cause pain and compel the loss of the tooth by extraction. What a contrast to much of the stopping done in this country!

Undoubtedly it is the duty of the Dental Surgeon to preserve rather than destroy, and I anticipate that eradication will give place to a more developed conservatism, and that *Dental Surgery* of the future will occupy a much more important position than *Dental mechanics*.

On the 18th day of August, 1840, a meeting of the leading Dentists of America was held at the American Hotel, in the City of New York, to form a *National Dentists' Society*. They mustered only sixteen in number, but were men eminent in their Profession, and their names were well known in America. Horace H. Hayden, of Baltimore; three of the Parmly's, Chapin A. Harris, J. Smith Dodge, Solyman Brown, and others; and to that day's deliberations we may attribute the rapid advance of Dental Surgery in that country, and the beneficial influence produced on the world at large. By means of periodicals, which reported the work transacted at their meetings from that year, I have watched their progress in the art and the results they have accomplished with great interest, and consider I owe to them a debt of gratitude for the information obtained through their discussions.

At the third annual meeting of the American Society of Dental Surgeons, held at Boston, in July, 1842, Eleazor Parmly, a man of considerable eminence in his Profession at that day, and probably one of the best stoppers of the period, read the introductory address; in which he told them he commenced his professional education with his brother at Montreal, in the year 1815, and from thence he went to Quebec, where he first saw a tooth beautifully stopped with gold by George Waite, of London. He had no idea, he said, at that time how the gold was secured, or what gave it its firm-looking body, and its smooth, solid, and polished surface. He some time after that saw other teeth that had been treated in England, and a gold plate that had been struck upon a model which he had never seen anything like in appearance before, as they had been accustomed simply to bend their plates into form with pliars. This determined him to visit England, and obtain all the advantages he could by prosecuting his studies and researches in this country. He appears to have obtained introductions to the leading practitioners of that day in London, and from thence he went to Paris, picking up all the information he could in that city. After which he returned to London and commenced practice there with his brother. His admiration of Waite's stoppings, which he frequently saw, increased. And other Americans, with a similar determination, pursued a like course, picking up everything in connection with Dentistry that was good in Europe, and taking it to America to lay the groundwork of the great American School.

Up to this period John Hunter, Blake, Fox, George Waite, Thomas Bell, Cartwright, and a few others had done much to give Dental Surgery a position in this country. Still, no Dental School had been established. Those who took up Dental Surgery as a Profession had to learn, as they best could, the mode of conducting their operations. It is true, lectures on Dental Surgery were given at one or two of the London Medical Schools, but they were of such a character as to be considered a part of the course required by the Medical Students, and had no special reference to pure Dentistry. All that could be learned of one's profession at that period, was obtained by means of an apprenticeship to a Dentist, and was limited to the particular mode of practice adopted by that practitioner.

It is true there were the published works of Hunter, Fox, Blake, Thomas Bell, and a few others to fall back upon; but there was no clinical teaching, such as Dental students of the present day enjoy, and which from 1839 (when the Baltimore College of Dental Surgery was founded) our American brethren derived the full advantage of in their Dental schools, and which is so much needed to obtain the necessary qualifications to carry out effectually the operations of such a mechanical art. These then, were the means by which they preceded us in the beauty and excellence of their operations, especially those connected with the stopping of teeth. Undoubtedly their Dental Association meetings gave such an impetus to their work—their striving to excel in the various operations, and the result of the marvellous fertility of their inventive minds, made public at these meetings, were the great features in their united national success.

Although the American School of Dentistry was taking a position greatly in advance of the rest of the world in *practical work*, all must allow, that in England, and on the Continent, there were men working hard at the more scientific branch of our Profession.

Thomas Bell, in his work on the "Anatomy, Physiology, and Diseases of the Teeth," published in 1835, had given us a text book that did admirable service in its day, and will long be referred to as one of the Dental Classics of our country, and I may say, of the world. On the Continent, about this time, Purkinji and Retzius, unknown to each other, conducted researches upon the structure of the teeth, with the assistance of the microscope. In the year 1835, the former, through his pupil Frankel, announced the discovery of the tubular structure of *ivory*. Nearly at the same time, Retzius, in a series of letters to the Royal Society of Stockholm, published the details of *his* researches. Nor must we omit to consider the valuable investigations, made about the same time, by Professor Owen, in the great field of Comparative Anatomy. Alexander Nasmyth, in 1839, gave to the world *his* researches on the structure of the teeth. About this time also, John Tomes was working hard at Dental Physiology, and making those investigations and discoveries upon the structure of the teeth, that obtained for him a higher position among original thinkers in his department of Surgery, than perhaps any have enjoyed in our time, the result of his labours being the production of works on Dental Physiology and Surgery which are the acknowledged text books of the day. I need not allude to the many admirable works which have been published, connected with our Profession, during the last twenty years, both in this country and in America, and several on the Continent, with which probably all are familiar, and they doubtless have had the most beneficial influence upon the general practice of Dentistry throughout the world.

In the mechanical department of Dentistry much has been accomplished by the Dentists of the last five decades. Many beautiful examples of the art were produced in our own country, as well as in France. Forty years since, by the manipulations of skilled workmen, the tusks of the hippopotamus and walrus were fashioned into a basis for artificial teeth; and one does not readily forget the productions of a Cartwright, a Merryweather, or a Parkinson, of London, a Stevens, of Paris, or a Woodcock, of Norwich, and many others, most of them long since passed away, and living but on the tablet of the memory. These were days when mechanical Dentistry was indeed an art, but its advantages were confined to a more contracted circle of patients than in our time.

The mineral teeth of fifty years ago were of a very inferior kind, and manufactured chiefly in Paris. In 1840, however, Claudius Ash, of London, brought out his mineral teeth, which were wonderfully good for a first attempt—a great advance upon those previously introduced, and a considerable step towards the production of teeth presenting a natural appearance, which in a few years were to supersede the human teeth in the construction of artificial sets, as well as in the selection of substitutes for smaller cases required in Dental deficiencies. Other manufacturers quickly followed in the race, and our American cousins, as usual, lost no time in competing with us in the production of teeth from models copied from nature; which must be considered a great improvement upon the earlier attempts of other countries.

A quarter of a century back, when vulcanized india-rubber was introduced as a basis for artificial teeth, one little thought it would create such a revolution in Dental mechanics as it has done, completely changing the character of our work. As a basis, it undoubtedly possesses many advantages over that obtained from the tusks of the hippopotamus or walrus; but the older practitioners, I think, sometimes look back with regret at the neglect that has fallen upon their beautiful bonework.

The introduction of celluloid as a basis for teeth, must not be forgotten, having, I know, many admirers; but at present it has not proved sufficiently successful in all hands to recommend it as a substitute for vulcanite.

To an American Dentist we are indebted for the great boon to suffering humanity that anæsthetics afford. In the year 1846, Dr. Morton, an American Dentist, first introduced the inhalation of ether for the production of anæsthesia during painful operations, which he successfully carried out in those connected with Dental Surgery. Dr. Boott, a physician of London, received a communication from a medical friend in America as to the process and its effects, and he, with the assistance of the late Mr. James Robinson, a Dentist in London, very quickly experimented with it in this country, and its introduction became most rapid for surgical operations of a trivial nature, as well as those of a more formidable character. Its use in those early days of its introduction was thought to be unattended with danger; but, unfortunately, a death soon occurred during its administration, which pointed to the necessity of caution being exercised in its employment.

In the latter part of the year 1847, the late Sir James Simpson, of Edinburgh—then Dr. Simpson—whilst experimenting with different vapours, discovered that chloroform might be inhaled in a somewhat similar manner to ether, and that it possessed many advantages over it as an anæsthetic. Unfortunately, some deaths having occurred during its administration for Dental operations, showing that it could not be used with impunity, led to its being much less frequently administered in Dental cases, and it gradually fell into comparative disuse in Dental Surgery, just as ether had previously done.

Again America comes to our aid with the introduction of what is, by some, considered an anæsthetic, but at any rate an agent suited for the production of a state of insensibility, and affording an immunity from pain during Dental operations, in the form of nitrous oxide gas, which had been used by Horace Wells, in 1844, for Dental purposes in that country, to a limited extent, before the introduction of ether. Happily, it stands its ground for these operations, having proved comparatively safe, and it is a great boon to the Dentist as well as his patients.

In the year 1855 it was thought advisable by many of the most accomplished Dentists in London, to establish a Society of Dentists "capable of supporting itself on an equality with the other learned societies in this country;" and it was also proposed by certain members of the Profession, "to memorialise the Royal College of Surgeons on the necessity which existed, for some recognised qualification, for those practising this speciality of surgery." This memorial was entertained by the Council of the College of Surgeons, and they arranged to grant a Dental diploma or license to practice Dental Surgery, and the first examination for it was held at the College on the 13th day of March, 1860.

The Odontological Society had been previously formed on the 10th of November, 1856, and its first meeting was held in January, 1857. A gathering of intense interest—for there was the delight felt and expressed by so many in meeting, for the first time, those they had long known by reputation—and then followed the commencement of friendships, and the creation of a fraternal feeling unknown to many before. These were among the pleasures derived from that first assembling of the Dentists of England in a constituted society.

From this period the art of Dentistry certainly made marvellous progress in this country. It became necessary to establish a Dental School in connection with a Dental Hospital, where students might be taught those special subjects required for the Dental examination. And the clinical teaching at the Dental Hospitals has afforded such excellent opportunities for the acquisition of manipulative skill, and a knowledge of the processes and means by which our American friends have accomplished their beautiful operations, and the good results of which are often seen in the great improvement that has of late years been visible in the general treatment of mouths that come under one's observation.

For the last few years a strong feeling had existed that some legislative measure should be obtained to protect the public from *charlatanism*, as in most towns in England, particularly in the larger ones, a class of persons were calling themselves Dentists and practising upon the unwary, although perfectly unqualified for the duties they professed to undertake, not only injuring the public, but robbing qualified practitioners of patients who should have come to them for treatment. This matter was taken up very warmly by practitioners in various parts of the United Kingdom, but more especially by those residing in the large towns of the Midland and Northern Counties; and this movement assumed active development in what was called "the Dental Reform Committee," the result of a meeting of Dentists held at Manchester, in August, 1875.

At a meeting of the committee held on the 30th of March, 1878, Mr. Tomes, the President, was empowered to forward a letter addressed to the General Medical Council, stating that since the Dental Practitioners Bill had been before Parliament upwards of eleven hundred Dental Practitioners petitioned the Legislature in its favour, and that out of the ninety practitioners holding a Surgical qualification, sixty-eight had memorialised members of Parliament individually in favour of the Bill; and in Scotland all the practitioners having also a Surgical qualification were in favour of the movement.

Thus it appeared the majority of those practitioners, having Surgical as well as Dental qualifications, considered the measure they were supporting was calculated to be of great advantage to the Dental Profession. Unfortunately they were not prepared to believe that a Dentists' Register, the result of the passing of the Dentists Act, would have to open its doors so wide as to admit those in its list who had really no pretentions to be called Dentists. I will not go into this subject further, as it is a painful one, for the result as you are probably aware was that, at least, two thousand names were enrolled which the promoters of the Act never for one moment imagined would have got there.

I think the Dental Reform Committee, after the Dentists Act was passed, acted wisely when they resolved to form it into the British Dental Association; and, by registration, it became a legally constituted body, whose object should be to see the Dentists Act was carried out faithfully, and that the Profession, as well as the public, had the full benefit it was intended to confer. Although, as I have said, in many points the Act was a great disappointment to many of us,—yet as it has now become the law of the land, we must abide by it, and all we can do is to assist the British Dental Association in every way, and as many of us as possible, join it, so that it may become an Institution of such magnitude, that it may cause its influence to be felt in future by the Legislature, should a supplementary Act at any time be introduced for benefiting our Profession. I assure you, gentlemen, the Administrative Board are quite alive to our wants and wishes, and are doing all that is possible to advance our professional interests in every way. The question arises—How can we, as the Eastern Counties' Dental Association, render some assistance in this good work? When we look around us, we find many persons practising as Dentists, whom we are unwilling to acknowledge as belonging to our fraternity. They advertise—they exhibit show-cases; they resort to unprofessional measures to obtain patients, which we are disgusted at. How can we bring them to our views, and admit them as members of our Association? It strikes me, gentlemen, that it behoves us to act liberally towards them, and to invite them to become members, provided they will give up at once those unprofessional acts, that are contrary to our rules—and not to refuse them admission because they have hitherto been disqualified by their modes of practice.

In the next generation, when the numbers on the Dentists' Register are reduced by death and otherwise, no doubt the practitioners of Dentistry will reap great benefits from the measure, as no one in future can be enrolled who does not undergo an examination, and obtain a Dental diploma.

In America Dentistry stands alone, and upon its own merits, unconnected with General Surgery and Medicine; in England it has been thought desirable to retain it as a branch of Surgery. In the early days of the Dental movement, I must confess, I considered it would be to the advantage of the Profession that it should stand alone—upon its own basis, and with a college or institute of its own, but afterwards

I came to the conclusion that our status would be improved by a connection with the College of Surgeons, which opinion I still entertain. And, gentlemen, surely it will be to the advantage of the public, as well as ourselves, to make every possible attempt to elevate ourselves by conforming to the maxims and rules of a Profession so elevated as the Medical, and make ourselves worthy of that connection which the Legislature has conferred upon us.

In future no one will be admitted to the Dental curriculum required for the professional examinations, until he has passed a preliminary examination in arts, to prove the candidate has been educated for a liberal Profession and is worthy of its membership. This is the only way we can claim to be received by the Medical Profession in consultation in Dental cases, which all must acknowledge will prove of inestimable advantage to our patients in the various cases that are constantly occurring in our daily practice.

Before concluding my retrospect, I would quote the following from a manuscript published in 1826 (by Leonard Keocker) on the state of Dental Surgery at that date :—

"The truth is, that in order to make our common Profession respected, we want nothing but that union and co-operation among ourselves, which have made Surgery and Medicine so respectable. The effect of such a cordial co-operation among its intelligent and justly respectable members, each contributing his utmost to the general stock of experience, would soon demonstrate the difference between science and quackery, sound practical knowledge and pretension, so clearly that the very multitude would be capable of distinguishing the empiric from the well informed practitioner. As long, however, as practitioners in general have only their own experience to guide them, and as long as individuals endeavour to benefit themselves by pretending to the possession of certain mighty secrets or patent improvements which are withheld from the Profession at large, and therefore placed beyond the reach of its just and deliberate appreciation ; as long as abuses of this kind are in the least encouraged, and not discountenanced and opposed by the Profession of Medicine and by the influential part of the general community, so long must Dental Surgery be an art of experience and conjecture, rather than of settled principles and well established efficiency."

How prophetic ! How true !—and yet 56 years have passed, and we are only now acknowledging the full weight of this forecast.

The *résumé* of my retrospect affords :—

1st. The decadence of Empiricism and advance of Rationalism.

2nd. The improvement of *practical* Dentistry with the growth of *theoretical.*

3rd. A recognised conservatism so necessary because nature has endowed the Dental structures with an excessive durability, but with slight power of repair.

4th. The introduction of anæsthetics and the advantages they afford.

5th. The formation of Dental societies and the increased facilities for obtaining Dental education.

6th. State protection, such as the necessity of the age demands.

7th. The suppression of quackery with the introduction of Dental legislation.

8th. And lastly, the development of the British Dental Association for the protection of common interests, the interchange of ideas, and the maintenance of the high honour and integrity of the Profession.

The *prospect* I offer to the junior members of the Profession is bright indeed, for their position will be a great contrast to that of the Dentists of the past, who too frequently have been ashamed of their calling from its surroundings. It will rest with themselves as regards the position they will be entitled to take.

We know how important our assistance to the general practitioner may be made in the treatment of the various cases that arise from Dental disease, and how powerless their treatment often is, until they have been assisted by the Dentist, especially in those cases arising from Dental irritation. From indigestion, occasioned by an imperfect condition of the Dental organs; from neuralgic affections; from burrowing abscesses, of obscure origin, travelling a long course under the muscular tissues before they develop themselves, but readily traced to their source when examined by one who knows his Profession. And how many cases of abscesses of the cheeks, and at the base of the jaw, have we not seen, supposed to be of a scrofulous character, and of long standing, which have been quickly cured by the removal of a tooth, or the roots of one.

If hitherto Dentistry has had a gloomy outlook, let us call to remembrance the meeting of the International Medical Congress, in August last, and, gentlemen, you who had the privilege of attending that enjoyable gathering of Dental representatives from all parts of the world—for such we might consider them, must have felt proud of that Profession which was, until recently, thought to be under a cloud. Yes! I feel *that* was a most congratulatory occasion, for Dental Surgery was well represented as a branch of Surgery at that great Congress of all nations. It took its legitimate position there; and those who heard the addresses at Section XII. (Diseases of the Teeth), and the papers read, as well as the discussions which were so well supported by different members of the Profession, from various parts of Europe, as well as from America, must necessarily have felt that Dental Surgery had at least received a recognition, and was taking its proper place among the other specialities of Surgery.

Thus, then, having rescued a Profession from the chicanery of charlatanism, and the wiles of trade, and having secured adequate State acknowledgment and protection, let us untrammelled place it on a pedestal:—

> "Quod non imber edax, non Aquilo impotens
> Possit diruere, aut innumerabilis
> Annorum Series, et fúga temporum."

With this end, let us strive to add largely to its Science, to establish its Pathology, while improving its Chirurgery, and ever following in the wake of the good ship "*Medicina*," we shall, undaunted by gale, tempest or typhoon, traverse safely the Sea of "Progress," seeking our Eldorado, the Perfection of our Art—just as the discoverers of new continents in past centuries, sought with the rising sun, the realisation of their dreams. By these means alone, can we secure for ourselves the thanks of suffering humanity, and the enduring admiration of generations yet to come.

The Association then suspended its sitting for two hours, luncheon having been provided for the members by the President, at his residence, Heathfield House.

At the afternoon meeting the following papers were read:—"Vulcanite manipulated on the plate and tinfoil system," A. Lindley Littleboy; "Gum treatment," George Cunningham; "Counter Modelling, demonstrated," William Marsh; "Wisdom Teeth," R. Wentworth White.

In the evening the members and visitors dined together.

MIDLAND COUNTIES' DENTAL ASSOCIATION.

THE Annual Meeting of the Midland Counties' Branch, was held on Wednesday, April the 26th, at Leeds. There were over forty members present, and Mr. H. Campion, M.R.C.S., occupied the Chair.

Mr. S. WORMALD (Treasurer) said their finances must of necessity be in a very satisfactory condition, because their expenses were very small. The meeting at Liverpool only cost £8 3*s*., and if the subscriptions were all paid up, he would have in hand something like £4 or £5, after paying the expenses of the present meeting. He hoped that in a short time, if their meetings continued to be held at such small expense, they would be able to hand over to the parent Association a handsome sum.

Mr. Stewart and Mr. Nicol were unanimously elected as President and Vice-President respectively. The re-election of Dr. Waite as Secretary, and Mr. Wormald as Treasurer, was declared; while Mr. H. Campion, Mr. G. Brunton, and Mr. Crapper, were elected to the Council.

It was decided that the next meeting of the Association should take place at Shrewsbury.

The PRESIDENT then addressed the meeting, and reverted to the chief events of the past year, and his retirement from the position of President which he had held during the past two years.

Considering the time the Branch had been formed, he thought the progress they had made had been such as to afford much encouragement, and also to stimulate them to renewed exertions for the future. At present it consists of fifty-four members and five associates, and he had no doubt that as time goes on, and the members of the Profession in other places become alive to the benefits to be derived from membership, the numbers will steadily increase.

Shortly before the last Council Meeting some papers were sent to several members of the Council containing advertisements from Dentists living in the district and holding Scotch diplomas. On consideration two of these were thought to be of such a nature as to require some notice to be taken of them. The Secretary communicated with the licensing bodies from which the advertisers obtained their diplomas; and in a letter received from the Secretary of the Faculty of Physicians and Surgeons of Glasgow, he says, "I have ascertained the facts respecting the two cases of advertising to which you drew my attention. In both cases the licentiates appear to have proceeded on a misunderstanding of the rule prohibiting advertising, to which rule they have engaged to conform."

That one of the Sections of the International Medical Congress should have been devoted to the subject of diseases of the teeth is a matter for congratulation, as it shows not only that the majority of medical and surgical practitioners are becoming alive to the important influence which these organs exercise on the general economy of health, but also their willingness that Dentistry should be fully recognised as a branch of the healing art. It only remained for them to show by their professional conduct and by the devotion of their best energies to the advancement of the specialty, that they were deserving of this honourable position.

The members then separated for luncheon.

The members re-assembled at 2 p.m., when Mr. Stewart, the newly elected President, took the chair, and delivered his Inaugural Address. Papers were read by Messrs. Murphy, Nicol, Crapper, Carter (The Increasing Degeneration of the Human Teeth), Brunton (The Conservation of Children's Teeth), and Richardson (The Second Fall of Woman).

In the evening the members dined together.

LEGAL PROCEEDINGS.

In the Nottingham County Court, on May 1st, Mr. Walter Browne, L.D.S.I., sued Mr. John T. Cottam, for £15 15*s*., for services rendered, £13 13*s*. of which were for stopping the teeth of the Misses Cottam, and £2 2*s*. for loss of time on an appointment they made, but did not keep, on the 13th February, when they gave only a day's notice. His Honour thought the question was whether there was a liability for £2 2*s*. through not keeping the appointment. As to the charges plaintiff said they were very reasonable indeed. The defendant's solicitor submitted that there was no case as to the loss of time on the second day, and that in the absence of any special contract the £10 paid into Court was enough. His Honour having summed up, the jury found that the amount paid into Court was sufficient to meet the claim. Mr. Browne has given notice of appeal, on the ground of the verdict being contrary to the evidence and to the judge's directions.

SUITS AGAINST DENTISTS.

In the New York Marine Court, a suit was recently brought by Mr. Thomas J. Kelly against Drs. G. Q. Colton and L. M. Slocum, for carelessness in permitting an accident to happen to the complainant during the extraction of a tooth while under the influence of nitrous oxide. The tooth, which was the first molar on the right side of the inferior maxilla, was extracted by Dr. Slocum. The complaint set forth that it was by the "advice and direction" of the defendants that the gas was administered; that the operation was performed so carelessly as to allow a fragment of the tooth to slip from the forceps and pass into and lodge in the trachea; that great pain and irritation resulted from festering, and that the patient suffered many days from sickness, and was at much expense for medical treatment. (The fragment of tooth was thrown out after many severe paroxysms of coughing.) The answer of the defendants was that it was beyond their control or power to prevent the accident, and that the use of the gas in no way assisted or aided thereto; that when the greatest care and diligence are used teeth will slip from the forceps; and that the plaintiff failed to notify them within a reasonable time after the tooth was extracted in order that they might remove the fragment.

After the hearing of considerable evidence pro and con, during which testimony was introduced by the complainant to show that the forceps slipped when the tooth was extracted, and that the defendant hurriedly performed the operation, and, on the part of the defence, that such an accident was liable to occur with the greatest care, the jury rendered a verdict which gave the plaintiff $500 damages. The defendants will appeal the case.

The following is the rule of liabilities of Dentists as laid down by Judge McArthur in the recent case, in Washington City, of William Joice *v.* E. P. Howland and S. T. Mason—Howland Dental Association—for injury done him in the extracting of his teeth.

"If the jury find from the evidence that the defendants held themselves out to the public as Dentists, and in that capacity undertook for compensation to extract certain teeth of the plaintiff, they implied, engaged, and were bound to use such reasonable skill, diligence, and care, both in the extraction of said teeth and in the subsequens arrest and treatment of any hæmorrhage or other injury occasioned thereby, as it ordinarily possessed and exercised by Dentists well educated in their Profession, and if there was any want of any such diligence, care, and skill upon the part of said defendants, or either of them, and the plaintiff suffered injury therefrom, he is entitled to recover. And in that case their verdict should be for the plaintiff, in such sum as they shall think will be just and adequate compensation to him for such bodily and mental suffering and permanent inconvenience and injury, if any, as they shall find he has suffered through such default of the defendants."

The jury found for the plaintiff; verdict, $250 damages.—The *Dental Cosmos.*

Editorial.

THE LIMITATIONS OF DENTAL SURGERY.

The study of the Limitations of Dental Surgery is one which deals with phenomena of a distinctly concrete kind; and these are physical and biological. The concrete sciences in their totalities cannot, as the term implies, be studied in the abstract; therefore, biological phenomena must be correlated with the physical. Physical science includes statics, dynamics, mechanics, heat, light, electricity, etc.; so that the principles of Mechanical Dentistry and of the filling of teeth are based upon our knowledge of physics. To the practice of the Science which takes cognisance of those principles is added Art, or skill, in performing or producing certain works, and thus is obtained an approximate locus and definition of those sections of Dentistry.

The biological phenomena which Dentistry embraces are morphology, physiology, pathology, pharmacology—indeed all that relates to our knowledge of diseases of the teeth and of their contiguous structures. The study of the relations of those component biological modes of force is essentially scientific, there is no Art about it. How much medicine, surgery, and materia medica shall be embraced in the study of Dentistry as a specialty, is a question, likewise, essentially scientific—it cannot be anything else. If Dentistry is to be regarded as a sub-division of the parent subject—medicine—, a definition of its relations to other sub-divisions is also essential to its classification as a scientific specialty. At the present time such a definition is wanting; the Limitations of Dental Surgery are left to the lamentable uncertainty of tradition, the variability, fallacy, and nescience of the incoherent ideas of individual practitioners.

A fundamental question like this, a subject of inquiry which, in its biological aspect, is in every respect scientific, must certainly come within the scope of those societies of our Profession that claim to be scientific, that have aspirations to be learned, and that have for their object the diffusion of knowledge. Yet, withal, one of our contemporaries expresses regret that such a question was allowed to be brought forward for discussion at the April meeting of the Odontological Society of Great Britain!

GOSSIP.

Prof. Burdon Sanderson, in his Lectures on Inflammation, delivered before the Royal College of Physicians, said it is definitely proved that, in the absence of septic contamination, inflammatory changes are of limited extent and duration, not that they are absent. Surely this is triumph enough for Lister's great discovery. Twenty years ago we all thought that John Hunter's sagacious utterance on the subject, that a "local inflammation cannot raise the temperature of an inflamed part above the source of the circulation," was a mistaken one; for by the very remarkable observations of Mr. Simon in this country, and of the late Prof. Otto Weber in Germany, it appeared to be shown that the temperature of the blood-stream returning from an inflamed part actually exceeded that of the heart. Notwithstanding the extraordinary care with which these observations were made they have not been confirmed by those who have repeated them. It has been established by observations relating to all sorts of inflammations, and made at every stage of their progress, that the temperature of the inflamed part never exceeds that of the rectum. Here, as in respect of other matters, we find that the most complete experimental observations are those of Cohnheim, who has shown in the most striking way that the increased temperature of external organs when inflamed depends on the activity of the circulation. For this purpose comparative measurements were made by him of the temperature of the fore-paw of a dog in a state of acute inflammation, and that of the opposite paw after division of the axillary plexus, the conditions compared being hyperæmia from vascular paralysis on the one side, and from inflammation on the other. It was always found that the temperature of the paralysed paw was slightly warmer than the inflamed, the difference between them being least when the inflammation was in the initial stage, and consequently the circulation most active. On this subject, therefore, John Hunter turns out to be quite correct, both in fact and theory.

A NEW step, the *Dental Register* says, has been taken in Chicago on the subject of Dental education. A plan has been arranged by which a full medical education, and the M.D. is to be required of each student proposing to practice Dental Surgery; after this is attained, or as it is attained, the student takes his special instructions from a Dental didactic teacher who is a member of the medical faculty. The instruction in Dental practice—clinical and prosthetic—will be given in one Dental hospital which is to be thoroughly equipped and large enough to accommodate the Dental students from all the medical colleges. The intention is that the Dental student may enter any medical college he chooses, at least, that has made provision for him. The aim will be to give most thorough instruction in the Dental infirmary and issue only a certificate of proficiency for that.

DURING the recent sittings of the Examiners of the Royal College of Surgeons Edinburgh, Mr. George John Lucas, Blackheath, passed his first professional examination for the Licence in Dental Surgery, and Mr. James Lindsay, Edinburgh, passed his final examination, and was admitted L.D.S.

AT the examination of the Faculty of Physicians and Surgeons of Edinburgh, held on April 28th and May 2nd, H. A. Murphy, son of Thomas Murphy, of Bolton, qualified for the L.R.C.P., L.R.C.S., and L.M.

THE President of the Odontological Society (Mr. Rymer) will entertain the Council of the Society at dinner at the Crystal Palace, on the 3rd inst.

GEO. C. MCADAM, L.D.S.Eng., has been appointed Honorary Dental Surgeon to the Hereford General Infirmary.

INTERCOMMUNICATIONS.

ANSWERS.

STUDENT.—As an additional qualification, the Membership of the College of Surgeons of England is the most popular, and is recommended.

JAMES HARDIE.—To publish the accusations contained in your communication cannot produce any good.

Communications.

Communications have been received from Thomas Murphy, Bolton; Dr. Langmore, London; Sec. Coll. Surg., Edinburgh; Gilbert Walker, London; Walter Browne, Nottingham; W. Stringfield, Lowestoft; Geo. C. McAdam, Hereford; Walter Whitehouse, London; James Hardie, Alloa; Richard White, Norwich; N. Miller, Preston; P. Headridge, Manchester.

Books, &c., Received.

"El Progreso Dental;" "Le Progrès Dentaire;" "L'Odontologie;" "Items of Interest;" "Journal of British Dental Association;" "Nottingham Daily Guardian;" "Manchester Evening Mail."

THE

DENTAL RECORD.

VOL. II. JULY 1, 1882. No. 7.

OPERATIVE DENTAL SURGERY,

Being part of a Course of Lectures delivered at the National Dental College, London,

By W. FINLEY THOMPSON, M.D., D.D.S.

(*Continued from page* 252.)

The case now presented for your consideration is one possessing unusual interest; and, should the method I propose to demonstrate be adopted by the Profession, the hitherto objectionable feature of wearing plates where one or two teeth are missing may, in some instances, be discontinued, and the arch be restored to its full complement of power by the replacement, without plates, of the nonexistent manducatory organs.

I formerly regarded with prejudice, and participated in the general impression as to the fallacy of, the means employed in cases of this kind; but I have witnessed results proving that, under favourable conditions, a lasting success may follow such treatment. The adoption of this species of practice must be entered on cautiously: for, unless the neighbouring teeth are of solid structure, in healthy relationship with the surrounding tissues, and have living pulps, failure, threatening the expulsion of the natural organs, may be predicted. The tendency of modern dental science has been to render interposed teeth as independent as possible of support from adjacent living teeth. But, success being the result of a judicious practising of the method now proposed, it is to be predicated that inherent weakness and unfitness of teeth appropriated to the task, or the use of devitalized teeth, may have discredited a method otherwise adding to the many resources of which we have need.

It is not the exception, but the rule, to find the arch broken in mouths presented for professional advice, the tooth lost almost invariably being the first molar..

Accepting this as a fact, I shall endeavour to show, 1st, the origin of this tooth, following its transitional stages up to the period of eruption; 2nd, the morbid tendencies to which the abnormality of this organ may be directly attributable; 3rd, a means of restoring one or more lost teeth through the interposition of others without plates.

Unquestionably the first molars may be looked upon as being more susceptible to the influences of disease than are any other members of the permanent dentition, except the wisdom teeth. The removal of the first molar produces a break in the continuity of the arch, and often entails upon the victim a series of evils quite overlooked, because not traced to the mal-efficiency of the remaining triturating organs. This intervening space, when existing at any intermediate point along the buccal line, more seriously interferes with mastication than if the loss were directly in the centre of the arch, or at its terminal points.

Appearing in the primary dental channel at a very early period of intra-uterine existence, this tooth enters the tuberosity of the maxilla shortly before birth, and its saccular development progresses contemporaneously with that of the deciduous teeth, but so much slower that it is delayed some two years in its eruption, after the completion of the temporary dentition.

The continuation of the first molar in its sac until the sixth year is through a period of successive and severe maladies in the infantile economy; the diseases of childhood being so numerous and attended with such fatality that in a general way it may be stated that nearly one half the human race cease to exist during the period in which the papilla of the first molar has passed through its varied stages of dentinification. At the time of eruption, the disorders of infancy will have reduced the children of contemporaneous birth to the extent of 633 out of every 1,000, thus showing the adverse influences which tend to direct nutrition from this tooth. Its eruption is also in unison with the general deficiency of calcification, characteristic at this age.

The completion of the temporary dentition is usually effected by about the fourth year; and, with the exception of such *causa morbi* as may develop in the deciduous teeth, no external manifestation of change is observable for some months subsequently, when the first molars continue their temporarily quiescent dentition.

The first molar, at its eruption, is very frequently mistaken by parents for a temporary tooth. Unrecognised it assumes its position behind the deciduous teeth; and a want of knowledge leads to neglect, under the idea that care is unnecessary; so that the tooth, which is for a long time in a comparatively feeble condition, is often irretrievably compromised before aid is sought. It is also subject to contingencies connected with the shedding of the temporary teeth, owing to lack of support and the force of the muscles not being distributed equally over the other molars and bicuspids, for some years subsequently.

The recorded results verify the prognosis we are endeavouring to establish; the first molar having the pre-eminence of any of its contemporaries in the frequent attacks of disease. From the tables of

Magitot it will be seen that about 33·5 per cent. of the total number of cases of caries are attributable to this tooth.

So great an antipathy exists to any mechanical appliance being worn in the mouth, that, when a few teeth only are missing, protests are made against auxiliaries of an artificial nature ; but such being the vicissitudes of the first or six year old molar, and the probability being so great that of all others it will be lost, provision should be made to restore this missing organ with the least possible discomfort to those who have been so unfortunate as to lose it.

In referring to the diagrams illustrative of the method now under consideration, will be seen the several stages as indicated; but a more comprehensive idea may perhaps be obtained from the model which I now pass for your inspection, the buccal view of which is shown in fig. 29.

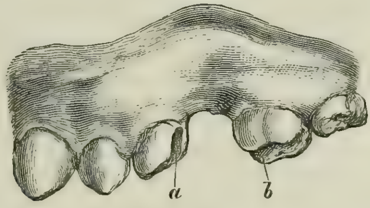

FIG. 29.

a b. Cavities prepared in molar and bicuspid teeth,—buccal aspect.

Here it will be noticed that the arch is complete, with the exception of the first superior left molar; and, as generally occurs, unless the teeth are extracted at a very early age, or before the eruption of the dentes-sapientiæ, partial closure only of the inter-space is the result.

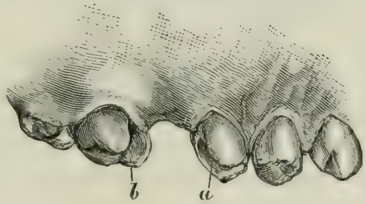

FIG. 30.

a. b. Same cavities prepared,—lingual view.

In this case, it will be seen that the two bicuspids have fallen back to anticipate the advance of the molars, the second bicuspid having receded until it is independent and quite free from any impingement upon the adjacent tooth. The first bicuspid, however, has followed it, until the inter-dental space between it and the canine is of much greater extension, showing that the canine has not retrograded in the same *pro rata* to effect a closure equal to that existing between the two bicuspids.

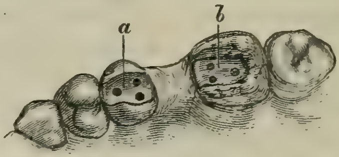

FIG 31.

a. b. Floors of cavities as prepared previous to adjustment of tooth.

Again viewing the space formerly occupied by the missing tooth, you will observe by the partial closure that a bicuspid only can be used. This I have had adjusted to the model that you may be able to see its relative bearings, not only upon the gum, lingual and buccal, but the manner of its attachment to the adjacent teeth.

The porcelain face being adapted to the buccal aspect of the gum, the deficiency upon the lingual side is fully restored with gold and contoured in conformity with the adjacent teeth (fig. 32, *d*), due observance being paid to its dimensions extending in a lingui-buccal direction. On the sides contiguous to the teeth are bars of pure gold, which extend into the adjacent teeth, overlapping upon the floor of the cavities to their medial points; and beyond this is located an anchorage in which to start the fillings that are to close in and securely fasten these projecting arms in place.

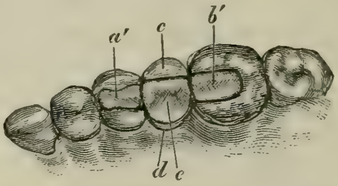

FIG. 32.

a. b. Cavities filled, indicating points showing terminations of cross bars in teeth.

c. Porcelain face.

d. Point of juncture of gum with lingui-cervical portion of interposed tooth.

e. Gold cusp, made in conformity to adjacent teeth, and to articulate with those opposing.

Without being influenced by the prejudices of others, I have endeavoured to enunciate a method which may, for a time, be sceptically received. The adverse criticisms by the Profession, heretofore, I believe to be caused by ill-advised operations upon teeth having their investing membrane complicated by disease at a recent or remote period. Hence the necessity of ascertaining the pathological condition of the organs that will permit an operation of this nature.

While in practice you are expected to follow the guidance of fixed principles, the mind should be free to accept any measures found more applicable than traditional methods. I have said that "unless the neighbouring teeth are of solid structure, in healthy relationship with the surrounding tissues, and have living pulps, failure may be predicted." I shall now qualify that remark by saying that, although pulpless teeth are objects of suspicion, there are circumstances under which the risk of attaching a crown to them, as just described, may be taken with little or no prospect of bad results. Immobility, evidencing the integrity of the periosteal circulation and the general tone of the wearer, should indicate when a devitalized tooth may be used for this purpose. I question, however, under the most favourable conditions, the advisability of actually fixing, in the manner already described, an artificial crown to a pulpless tooth. In view of its lack of vitality, it would be better, if possible, to avoid any tension further than vertical pressure.

In another case I am about to describe, the original space of the missing bicuspid was but little diminished, so that the substitute was modelled in nearly the form of the original tooth. Its cervical boundary was made to accurately fit the surface of the gum, while cusps and concavities were established on the crown, in perfect conformity with the indentations and cusps of the antagonizing teeth. The arrangement for its retention was somewhat different from that in the case just illustrated.

The first bicuspid—devitalized—permitted the connecting-bar on the ante-approximal surface of the substitute to be formed so that it fitted into a prepared socket. But in the molar—a living tooth—the filling was much more circumscribed; no vertical turn could be given to the attachment which it was proposed should pass from the substitute into the filling. One end of the bar was placed in a nearly horizontal position, and projected at slightly less than a right angle to the post-approximal surface of the substitute.

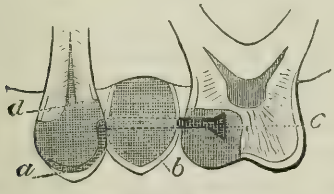

FIG. 33.

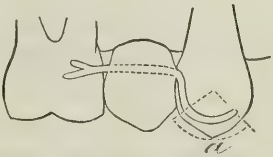

FIG. 34.

After the preparatory cavities in the teeth were filled, a secondary cavity in the gold was formed, and the interposed tooth adjusted to the gum, and articulated with the occluding teeth; the extension-bar (*b*, *c*, fig. 33) was then secured by building it into the secondary cavity in the filling of the molar. The model which I submit for your inspection will perhaps better explain my meaning, which is still further illustrated by figs. 33 and 34. The arm on the ante-approximal portion, being of greater length than that on the post-approximal, is bent into a curve which forms part of a circle having the groove in the filling, corresponding in curvature to the wire, for its circumference.

By this arrangement, the dead tooth is permitted to vibrate through a short arc (*a*, fig. 33) without altering the nature of its attachment. The curved arm (*a*, fig. 34) is adjusted to accurately fit the groove; pressing the tooth firmly, but not aggressively. The grooved socket, extending over upon the occluding surface, is formed entirely in the gold filling, no fractured or decayed portion of the tooth at any point being exposed to the secretions of the mouth, while the extension-arm and socket are simply the action of gold upon gold.

In the case of two bicuspids, I had the missing teeth carved in block, so as to fit the model and articulating cast. A platinum bar, which extended through both teeth, was adjusted in the block similar to that represented in *b*, fig. 34. In using mineral teeth, the chances of detecting them as artificial are much lessened, while the artistic appearance of the work is materially enhanced.

The buccal and lingual aspects of the substitute must be contoured so as to strictly conform with the natural curve of the arch, the object being to make this foreign body undistinguishable in form from a natural tooth, while its very existence should, during the ordinary avocations of life, be forgotten by the wearer.

Where the arms require to be made very delicately—the shape or condition of the teeth not permitting extended excavation—, pure gold, with such small sectional dimensions, will not be sufficiently rigid. The bars are then to be made of platinum, this being a malleable and tenacious metal, which, once established in position, is apt to be retained.

EROSION:

THE PROBABLE CAUSES AND TREATMENT.

A Paper read before the Students' Society of the National Dental College.

By J. J. Bailey, L.D.S.Edin.

Mr. President and Gentlemen,

The subject to which I would ask your attention for a few minutes this evening is one which has not, I think, been brought before this Society for a considerable time. It is with little hope of doing justice to the subject that I have undertaken to say a few words concerning Erosion, but rather because I feel sure there are many here who are interested in this question, and the benefit of whose opinions I shall be glad to have.

The disease which we term Erosion, does not seem to have received the attention which its frequency, and the havoc it causes, demand. I think the opinions of nearly all writers on the subject will be found in a paper read by Mr. Coleman before the International Medical Congress, 1881, and from which I have made several extracts. The earliest recorded notice is by Hunter, who termed it decay by denudation. After having alluded to the singular appearance these cases present as though filed and highly polished, he concludes as follows, "From its attacking certain teeth rather than others in the same head and a particular part of the tooth, I suspect it to be an original disease of the tooth itself, and not to depend upon accident, way of life, constitution, or any particular management of the teeth."

Mr. Bell, in a paper entitled "Loss of Enamel and Wearing Down of Teeth," says, "The groove is perfectly straight and continuous through its whole extent, and is often regular and smooth as if it had been formed by a fine round file, and afterwards polished; when the bone has been exposed by this process it sometimes becomes very slightly discoloured, but remains for a long time perfectly hard and sound, and seldom exhibits any appearance of gangrene."

During a discussion at the Odontological Society, in 1870, Mr. Harrison, in the course of some remarks on the subject, said he at one time thought it must be due to certain absorbents in the teeth themselves, not yet discovered; but was obliged to abandon his theory on seeing an artificial lower piece presenting this abnormality. The denture had been carved out of hippopotamus tusk, and had been in the mouth about two years. On coming under Mr. Harrison's notice, he found a number of transverse lines running from canine to canine. Enquiry elicited the fact that it could not be due to excessive application of the tooth-brush. On seeing this case, he was compelled to abandon his old theory and come to the conclusion that it was, in all probability, produced by some peculiar action of the secretion, or of the absorbents, or of both, of the mucous membrane of the lower lip.

I have here an upper denture set with natural teeth; and though the majority of the teeth are attacked by caries, I think there are indications of Erosion on several, although some of these seem to have degenerated into true caries.

Mr. Campion is inclined to think it never occurs in necrosed teeth, apparently inclining to the belief that it must be owing to some vital process.

Mr. Salter, in his "Dental Pathology and Surgery," under the heading of "Surface Wear," after alluding to the similarity of Erosion and abrasion, proceeds as follows, "The causes of surface wear may be stated to be predisposing, consisting of an inherent softness of structure which certainly exists in some syphilitic teeth, and probably in other conditions; and exciting causes, such as molar mastication with incisor teeth, gritty food, a hard tooth brush, certain tooth powders, especially vegetable charcoal, which usually contains particles of silicates of lime and potash. It is probable that in some cases the wearing is assisted by a solvent or softening action of the saliva, but the polish I believe is always occasioned by friction." He seems rather inclined to attribute many of these cases to syphilis, especially those where the cutting edges of incisor teeth are reduced.

Dr. Magitôt considers these clean and polished notches as nothing else than caries which has passed into the condition of spontaneous cure or dry caries.

Mr. Coleman has arrived at the conclusion, "That the main element is friction, but that the condition which permits the loss of substance thereby, is favoured by a change or degeneracy in the tooth itself." He suggests that change may be owing to fatty degeneration of the contents of the dentinal tubuli and the formation of a fatty acid; or, as an alternative, he surmises it might result from a lessening of that power of resistance vaguely termed vital force. But, if the latter, one would expect to see it in dead teeth more than in living ones, whereas he leans to Mr. Campion's view that it does not occur in necrosed teeth, which teeth must have lost their power of resistance. With regard to the agencies which furnish the friction, he says he has never seen a case in which it could not be imputed to either tooth-pick, brush, lips, tongue or saliva.

I have endeavoured to give, briefly, the opinions of several authorities as to the cause of Erosion; but, I imagine, with the result that, though we may believe the old adage, "In a multitude of counsellors there is wisdom," we must have come to the conclusion that their wisdom is in this case *slightly* confusing.

I have purposely left till last the opinion of one great authority—Mr. Tomes. After describing the disease, he sums up as follows, "Absorption cannot be called into account for the removal of the tooth-substance, for it often takes place at spots remote from any structure capable of developing an absorbent organ, and it seems that we must fall back upon the idea that it is an example of chemical solution. But whence the solvent comes, and why the affected surfaces are not the site of ordinary caries, are questions which remain unsolved, though it seems probable that mucous, by fermentation, or affording a nucleus for fermentation, may provide an acid solvent."

If I might offer an opinion of my own on the subject, I should feel inclined to accept Mr. Tomes's theory, partly because I may possibly have found a solution of his question as to why the attacked parts are not the seat of caries. Before, however, I ask your consideration of this idea, I shall just remark on one or two peculiar appearances which these cases present. I do not intend to trouble you with a minute description of the disease, as that is pretty well known to all of us. I think all observers in describing the disease have agreed that these depressions may have sharp, well-defined, or even overhanging edges; or, the whole circumference may slope off to the surface; but there is one characteristic which has not, I think, been remarked. It is that we may have sharp edges, but that they never extend the whole circumference, there will always be found two points, and these opposite points in which the cavity slopes off to the surface of the tooth. In other words, whatever be the shape of the cavity in one direction, sharp edges or sloping, in the other it will always be so formed that an instrument or point may be passed from one side across the cavity, and emerge at the other side without meeting with any obstruction.

We have seen that Mr. Coleman considers the prime agent is friction, but is willing to attribute it to quite a number of causes, viz., tongue, lips, tooth-pick, brush, saliva, etc. Now it seems difficult to think that a disease so uniform in its characteristics should be directly caused by so many agencies. I have myself thought we must try to find some cause to which we can always attribute this affection. We know the tooth-brush cannot produce it in every case, though it is undoubtedly often an important factor; neither can the lips, tongue, etc. Mr. Coleman alludes to the action of the saliva, and, in support of that theory, mentions the wearing away of stones by the continual dropping of water.

For some little time I have been observing several cases in the hope that I might possibly find a clue. I have not, in the somewhat limited period, seen a very large number of cases; but, from what I have seen, I am inclined to think that Erosion is caused by the mechanical action of the fluids in the mouth. I would give the lips, tongue, etc., a secondary position, considering that they chiefly act as motive powers to the fluids. There are one or two reasons why I think this to be the case.

In the first place, all cases of Erosion are in a position subject to the action of the oral currents; for the fluids may take such varying directions in different mouths, and even in the same mouth. We know what a small thing is sufficient to vary the current of a running stream, and in like manner a small cause as a slightly projecting tooth may be quite enough to determine the direction the fluids may take. An instance may be found in, say, an upper central incisor, where Erosion has occurred at the neck of the tooth in front. As the denuding process encroaches on the tooth and gets deeper, we may see the lateral extremities take one of two courses; it may take on the form of caries, in which case we shall probably find that the teeth are crowded together so that no fluid could possibly pass between them; or the Erosion may proceed round the side of the tooth, though such tooth will, I think in the majority of cases, be naturally narrower at the neck, and it will be found that there was previously a slight space through which liquid could pass. In some cases the tooth-pick may have helped the process.

Secondly, the characteristic shape of the cavity is such that it will always form a channel along which fluids can pass unobstructed.

Thirdly, though all cases can be accounted for by this agency, there are certain cases which I can account for in no other way. These are some of the reasons why I incline to this view.

Though I think this to be the mechanical cause, I of course rely upon the idea that there is a predisposing cause, though it does not necessarily produce Erosion. I am inclined to think that this is the same that often precedes caries. I imagine there must be some secretion which has the power of softening and dissolving the tooth-substance, the result of which may be either Erosion or Caries. Now what is it that determines whether the sequel shall be the former or the latter? I think this entirely depends on whether the attacked part of the tooth is under one or other of certain conditions. If the part is under such conditions that the dissolved substance can be easily and frequently removed, and that by liquids always moving in certain directions, then I apprehend we shall find Erosion will supervene. If, however, the part is in any way protected from exposure to cleansing influences, then the dissolved material will remain and form a nucleus of decay, in which fermentation, with its attendant leptothrix, etc., will soon appear. In short, we shall have all the appearances of caries.

We now come to the question, Why do we see the teeth in one mouth subject to Erosion, and in another mouth the corresponding teeth attacked by caries? The position of the teeth and all natural conditions may apparently be alike in both. I think the deciding point depends upon the extent to which the self-cleansing agencies are at work. We all know what a vast difference there is in the cleansing power of our patients. We might give some glass after glassful of water to rinse their mouths with and they would then have hardly removed any foreign matter which might be on the teeth; while other patients' mouths would be infinitely cleaner after rinsing with one mouthful of water. In the former case I do not think we should find Erosion; and, with one exception, I cannot remember having seen any in such a mouth; indeed, since my attention was drawn to the subject, I certainly have not met with it, while, on the contrary, caries has been prevalent enough. Again, in *all* cases of Erosion which have come under my notice, the patients have used the oral muscles to a considerable extent; the one exception, before alluded to, being that of a molar in rather a prominent position, and, on inquiry, I learned that the patient used a considerable amount of force with the brush. I have frequently and purposely in such cases covered the teeth with a foreign substance, such as pumice powder, having forced it well between the teeth, both those in which Erosion was still progressing, and those in which the contour of the teeth had been restored. Having done this, I have allowed the patient just one mouthful only of water to rinse away the material. I have then examined the mouth, and have invariably found it thoroughly clean,—almost every particle, in some cases every atom of powder having been removed. I have taken numerous opportunities of testing this, and the result has always been the same, the patient having made considerable use of the muscles of the mouth. In polishing fillings for patients not subject to Erosion I have often had the greatest difficulty to get them to remove the polishing material by mere rinsing; they apparently have no idea of moving the muscles of the mouth, but just let the water roll round and out again. How far this may be the result of different temperaments I cannot say, but think that may possibly have some governing influence.

To recapitulate, it seems to me that we may consider Erosion in its first stage to be nothing more or less than the beginning of caries; in fact, a dissolving of the tooth-substance which, however, never gets beyond the initial stage, as the materials are removed almost as constantly and continually as they are dissolved. Let this intermittent but frequent removal of the acid solutions cease, and I think we shall find caries will soon appear. We often see teeth attacked by Erosion, and adjoining the denudation we also perceive caries. Though there is a marked contrast between the two, yet the one often merges imperceptibly into the other.

We now come to the treatment of this mysterious affection. This must, until we know the causes, be, to a certain extent, empirical. It should be directed to restoring the tooth to its former contour, thus obliterating the friction channel. Mr. Coleman says he has found the constant application of ammonia, or one of its compounds, if persevered in, to arrest the disease. He uses sal-volatile, applied three or four times a day, arguing that the alkilinity of the ammonia may neutralise the acid conditions of the contents of the dentinal tubuli; thus removing the predisposing cause. Other writers recommend the use of nitrate of silver, but this gives a black unsightly appearance, though, I believe, it is effectual in the majority of cases. Chloride of zinc is also suggested.

Many cases seem to be particularly suitable for gold, providing it is thoroughly well done and polished, care being taken that not the slightest edge is left. But in proportion as the saving power of a gold filling seems to justify its use we often find its unsightly appearance would considerably nullify its advantages. Hence we must frequently have recourse to some other material. The various amalgams and white cements all give way in these positions, but we have one other substance to fall back upon, and that is gutta-percha. I have known cavities carefully prepared and filled with this to last a long time and give satisfaction to both patient and operator.

In conclusion, while thanking you for the attention you have given me, I cannot but be aware of the many imperfections which exist in the paper; however, I trust that what I have said may have been sufficiently interesting to prove a subject for discussion.

SUGGESTIONS AS TO THE FORMATION OF A BENEVOLENT FUND.

Read before the Midland Counties Branch of the British Dental Association, April 26th, 1882.

By J. S. Crapper, L.D.S.I.,
Dental Surgeon to the Rugeley District Hospital.

Mr. President and Gentlemen,—I wish to bring before you a suggestion which, if carried out, will in my opinion redound to our credit as an Association, and may possibly be a substantial benefit, even to some of our present members and their families. I have for some time conceived that it is desirable that, connected with our business and social meetings, we should have a benevolent fund. In societies of every kind men have learned to recognise the importance, if not the absolute necessity, of such a fund as a practical part of their organisation.

This is the case not only in what are termed "Friendly" societies, but in institutions formed for social enjoyment or for defensive purposes. We all know that in our own Profession appeals have occasionally been made to us for aid in cases of distress, which have arisen from sudden and unavoidable causes. And such circumstances will inevitably recur. I have for some time been impressed with the belief that it would be far better to have a permanent fund to meet all emergencies than to have individual appeals made periodically to our generosity, and, I may say, to our charity. Seeing, then, that we are called upon to exercise our benevolence, and believing that such must ever be the case in this as in other societies, our benevolent fund should be the outcome of mutual contributions. It is not aid to those who do wrong, not support to the idle and the profligate (of whom I am proud to say our Society does not consist), nor assistance for those who are unworthy of, or unfaithful to, our Profession, that I seek to provide; but I desire to see established a fund to afford aid to those members of our Association and their families, who may be reduced to distressed circumstances by unforeseen and uncontrollable turns in Fortune's wheel. By making this provision from the mutual contributions of the members, any such help to a distressed member or his family will be deprived of that unpleasant character which is necessarily attached to the sums raised by direct appeals in individual cases, such as those of which we have had painful experience in the past. I maintain that it is incumbent upon us to assist a member who is in pecuniary distress; and we ought to be in a position to do this in a manner which cannot wound sensitive feelings by the publicity of such distress, or by the unnecessary display that the aid that is rendered is in the nature of charity. If the meeting should think fit to affirm that it is desirable to establish a benevolent fund, a small committee might then be appointed to prepare rules for managing and dispensing the fund, towards which I shall be happy to contribute ten guineas.

WHAT IS FACIAL NEURALGIA?

By Parsons Shaw, D.D.S.

Writing in the *Missouri Dental Journal*, Dr. Parsons Shaw, of Manchester, England, says:—I have been requested to report the following case, and do so for the sake of its lesson, the names of all the parties, for obvious reasons, being suppressed. A well-known Dentist in one of our largest cities was called in consultation with the regular medical attendant, a deservedly eminent practitioner, to see an old patient, whom he found had been confined to his house for more than a month, and for some time even to his bed, with what had been regarded as a severe attack of neuralgia, and for which he was then under treatment. He described his pains as mostly confined to one side of the face, but often shooting through the entire face, and frequently extending into the head, neck, back, and even more distant regions. The Dentist inquired into the condition of the teeth, and was told, what proved to be true on examination, that they were not at all decayed or sore, but that a little matter had been observed at the edges of the gum. He could not say, at the time, he had noticed any discharge of pus from, or had perceived any fœtid smell in, his nose; but afterwards remembered that he had. There was no very perceptible swelling of the face, yet the patient pointed to a sore place just beneath the eye, and close examination showed it was a little puffed on the side where the pain was mostly felt. He had become very weak, and his whole system was generally deranged. It was evident that this patient was suffering from a severe attack of inflammation in the lining membrane of the antrum. When the regular medical attendant heard this opinion, he at once concurred in it, and also agreed to the desirability of the course of treatment suggested by the Dentist for the discharge of the accumulated pus in the antrum. But before he would consent to any operation, he thought it desirable to have the opinion of a certain eminent surgeon. Two days had to pass before this gentleman could could be got in attendance; the patient's sufferings going on, and the chances of his recovery being greatly reduced in the meanwhile. In time, however, the physician, surgeon, and Dentist met, when the strong advice of the latter was acted upon, and a molar tooth removed, with the understanding that if this did not procure sufficient discharge of pus from the antrum, an opening was to be made by means of the Dental engine. The tooth was removed with very little exertion, and a considerable quantity of matter discharged, but it was evident that little of it came from the antrum. The Dentist, in due course of time, took his leave, quite expecting to be again called as soon as the patient had recovered somewhat from the first, to perform the second operation, which all had so far agreed with him to be necessary for the removal of the primary cause of the illness. But he was not again consulted, beyond being asked, a few days after the extraction, to determine a question which had arisen between a fourth authority—a consulting physician who had been called in—and the attending physician, as to the character of several pieces of necrosed alveolus, which the patient had removed with his fingers, this physician having declared it was a part of the tooth which the Dentist must have broken in the extraction! As the Dentist was not again consulted, he only knows what took place informally, and not from his own observations; but the information is sufficiently accurate for us to come to a definite conclusion.

As the patient got gradually worse, it was given out, as the result of the combined opinion of his medical advisers—minus the Dentist—that he was suffering from a *complication of disorders*, such as neuralgia, sciatica, gout in the feet, Bright's disease, etc., as if each of these were idiopathic, acompanied by intermittent febrile symptoms. In about eight or ten days after the removal of the tooth, he had a severe rigor, which was repeated at irregular intervals; and in just fourteen days after the operation, he died. The symptoms pointed clearly to a case of pyœmia. The pent-up pus, which had been accumulating in the antrum for more than a month before the cause of his symptoms was discovered by his Dentist, had, in all probability, wrought sufficient mischief to render the patient's recovery doubtful; the more especially as the alveolus was found to be so much necrosed as to come away in large pieces; and albuminuria had already developed. Yet, if the antrum had been opened, as was advised, and the matter removed, and an antiseptic treatment adopted, there was still a chance of recovery, as the patient lived two weeks after the removal of the tooth; and while there were febrile symptoms, there was no rigor for some time; whereas, death from blood poisoning, results, as a rule, in from four to ten days. The possibility of recovery was also heightened from the fact that the patient had a good constitution and enjoyed excellent health.

It is not pleasant to look back on a case like this, and nothing but a strong sense of duty, and the conclusion to which it unmistakably points, could induce me to do so. Is it not high time that Dentists took this "facial neuralgia" theory in hand and exposed its errors, and, as we have seen, sometimes fatal consequences? It is not diagnosis, but pure charlatanism, to tell a patient who consults a medical man for the relief of a facial pain, that he has a "nerve-pain." He knew that quite well enough, and what he wants is relief. But it is not proceeding towards this desirable end to assume that a pain cannot better be defined than by the use of a term the patient does not, as a rule, understand; or if he does, concludes it is one of those general terms, which has, by common consent, become crystallized into a definite meaning, which is well understood by those who use it; that his symptoms are his disease; and by the confident manner in which he is thus assured, lead him to believe that, even if he does not understand the meaning of "neuralgia," the doctor knows all about his case. It is a common occurrence to find patients treated for weeks, and even months, for neuralgia, while any intelligent Dentist would, from the patient's description of the symptoms alone, at once say they arose from either odontitis or periodontitis; or, failing these, inflammation of the lining membrane of the antrum; and this apparently without a suspicion on the part of the medical attendant that the pain had any such origin. Even when alveolar abscess has caused the face to swell, I have known men, justly regarded as eminent physicians, to treat the patient for erysipelas. And, also, when the pus had been induced to approach the surface by means of powerful irritants, to lance the face in order that it might discharge in that direction, and then declare it a case of scrofula. There can be nothing without a cause; yet, so-called facial neuralgia is regularly treated as if it arose without any definite cause, or from some general or remote cause, which was quite too obscure for anything like accurate diagnosis, while in nine cases out of ten the origin of the pain so described stares one in the face the moment the mouth of the patient is examined; and almost invariably is only obscure to inexperienced or superficial observation. So true is this, that to the astute Dentist no meaning will be attached to such a term as facial neuralgia, for he knows that if the pains do not arise from some lesion in or around the teeth, or in the antrum, the origin may then be looked for deep in the neural axis; in which case the patient is in a condition to demand the most anxious attention of his medical adviser and nearest friends. Some years since I had just such a case in my own practice. The patient complained of pains in his head and face after I had made certain they could not arise from his teeth. When he applied to anyone else for advice he was assured he had "neuralgia," and my suggestion that his brain was in some way affected, received no encouragement from the physicians he consulted, simply because they regarded his pains as an ordinary form of what is taught to be a well-defined complaint. In time he died so suddenly that a *post-mortem* examination was required, and I was ordered by the coroner to attend it; when, after much search, the pineal gland was found a mass of disorganised matter. The erratic pains were then accounted for by some disturbance in the reflection of nerve irritation.

Such cases as are here named might be repeated by the score by any observant Dentist. Yet we allow them to go on, and the general practitioner to assume superior knowledge, where we are the best teachers.

WEDGES AND WEDGING.

By JUNIUS E. CRAVENS, D.D.S.,
Operative Dentist, Indiana Dental College.

IN Operative Dentistry, the teeth are often separated; for two general objects: *permanent* (conservation), whether decayed or not; *temporary*, usually for accessibility in preparing and filling cavities. The latter (temporary) separation is the operation under consideration just now. A temporary separation, under any circumstances, is simply one of convenience. The inventions and contrivances that have been produced and recommended for temporarily pressing the teeth apart, are, to say the least, more numerous than the teeth, by far. It would be a tedious task to arrange and report all such devices, but it may properly be stated that the materials employed for this purpose have been confined to a few, such as metal, wood, sea-tangle, caoutchouc, tape, and cotton. All have been employed successfully, and each has disadvantages. Metallic appliances apply force by means of screws, or springs, by which teeth may be moved gradually and surely into or out of position. To apply metallic devices, spaces must be already at hand to admit of the interposing parts; and if such space is wanting, a separation of accommodation must be resorted to. It is sufficient to state here that metallic appliances for moving teeth should be used only in correcting malposition.

Wood is perhaps the original material for temporary separations. It is employed simply as a wedge, which is forced between the teeth by steady, persistent pressure, or driven in by mallet force. The teeth are literally driven apart, on the moment, by the wooden wedge system, and the bony walls of alveolus are compressed at once; no time or opportunity being afforded for recession or resorption. More force is needed in this process of wedging than in any other operation common to Dentistry, with a possible exception in favour of extraction. The pain is always great; the after sensation is usually distressing, and the life of the pulp is often jeopardised. If the teeth to be separated are in very close contact, the wooden wedge must be made very thin, in order to render its insertion possible, but the thinner the wedge, the greater tendency to split or sliver in attempting to drive or force between the teeth; and yet this form of wedge or separator has nearly attained universal acceptation in the Dental Profession.

The sympathetic natures of Dental operators, added to ingenuity, lead to the adoption of materials that after being placed tightly between the teeth, would expand or enlarge, gradually, and thus accomplish the desired separation without much inconvenience or suffering. India-rubber was first perhaps to be used, on account of, not expansibility, but contractility. A piece of rubber, such as is employed for filing papers or binding packages, may be easily stretched, and thus make it so slender and subtle as to render its insertion possible in any case of approximal contact of the teeth. In fact, rubber can be inserted when nothing else can. Of course, when rubber has been stretched to great tenuity, placed between two teeth, and then the ends of the rubber liberated, the substance instantly tries to contract to the original form, and *thickness*. As is well known, rubber, when stretched, is persistent in contractility; as a result, persistent expansive force is applied between the teeth, and gradually they recede from the force, and are separated.

The objections against the use of rubber are few but strong. While it is painless in adjusting, it causes the most aggravating periostitis, in twenty-four hours, in many cases. Rubber should be used with the following restrictions: When the teeth are too firmly in contact to admit of any other separator. It should be cut into strips as narrow as practicable, in order to reduce its wonderful power of contraction. It should be removed whenever teeth have separated enough to admit the use of any other form of separator or wedge as a follower. In fine, rubber should be used as a *pioneer* only, and usually should be removed in eight or ten hours.

There is a species of sea-weed, sometimes called *wrack*, but commonly known to Dentists and Surgeons as sea-tangle (*laminaria* *digitata*), which has proven to have wonderful expansive powers. It will enlarge to several times its original diameter, by saturation in saliva, and this property has led to its use as a means of separating teeth. But its expansion is so very great and rapid, that it requires to be used with a great deal of caution. It should be used in very slender bits, using following wedges of plain wood to rest the teeth and relieve soreness.

Tape is employed efficaciously: by adding one or more thicknesses as the teeth recede, almost any amount of space may be obtained. The tape process is very slow, but saturation tends to expand, so that the teeth do finally move.

Cotton is used also for separating temporarily by a few Dentists in America, but more extensively in England. The fibres must be gathered loosely, and twisted between the thumb and finger of either hand, so that the central part will be somewhat thick, the twist tapering down toward each end, where it becomes a fine thread. When twisted pretty hard, the cotton should be doubled in the middle, when the whole will become twisted like a periwinkle shell or a twist of tobacco. Long staple cotton is best for this purpose. A cotton wedge should be renewed daily, until the proper space has been gained. The cotton tent is probably the most practical, simple, and inexpensive, always at hand, twisted in a moment, and causes the least discomfort; it may also be medicated before or after placing, when desirable.

The common or customary manner of inserting wedges of any kind is erroneous, and this may be understood by a moment's consideration. The teeth are arranged in an arch; from molar to molar the teeth are formed like keystones, curtailed wedges; and the inter-dental spaces, as a rule, open towards the center of the mouth. According to custom, when a Dentist wishes to insert a separator or wedge, he does so by applying force from without, inward. Now, if we consider for an instant the direction of strength of an arch, it is easy enough to see that Dentists have for half a century been pushing and pounding against an arch from its stronger aspect. The spaces opening inward, render that the easier aspect for inserting a wedge of any sort; besides the force of wedging and expansion, if exerted from the concave side of an arch, meets with the least resistance. It is always easier to move the teeth outward than backward. Apply wedging force to the dental arch, from its weaker side, and results will be quickly attained and more satisfactory.—*Southern Dental Journal.*

THE BIOPLASSON THEORY.

By C. HEITZMANN.

THE following is an abstract of an address delivered before the New York Odontological Society, February, 1882, and published in the *Dental Cosmos*:—

According to the new views, the structure of the plastid (cell) is a very complicated one. Indeed, we are astonished to see that every particle of a plastid—its smallest portions, for instance granules thrown off—floating about in a liquid, is endowed with all the properties that formerly were attributed to plastids; that is, motion and growth. We become convinced that it is not the plastid which is the elementary organism, but the granule of living matter; and this is considered as elementary only for the reason that our microscopes do not show more. If in time to come our lenses shall be constructed of better refracting media than glass (of diamond, for instance), perhaps we may discover more than we know at present.

New views were also obtained concerning the structure of organisms ever so highly developed. It has been demonstrated that the body is by no means composed of isolated elements, so-called cells, as it was formerly thought to be. The best observers have held that the body was composed of a great number of individual cells, much in the way that a house is constructed of bricks—put together by cement. The bioplasson theory suggests that in the tissues of the body there is no such thing as an isolated cell, but that the tissues from the crown to the heel are one continuous mass of living matter, mainly in a reticular arrangement. Only the closed cavities of the body, the lymph- and blood-vessels, contain in a fluid isolated bodies in the shape of lymph- and blood-corpuscles, etc. In this view, therefore, the body is constructed like an engine in which all parts, though independent to a certain degree, are connected with one another so as to build up a continuity and render even the organism of man a grown complex amœba.

The new bioplasson view has thrown light upon the mode of development of the organism. Gradually the fact has been acknowledged that there are at first three layers or leaves from which all tissues arise, the name epiblast designating the upper layer, mesoblast the middle, and hypoblast the lower layer. Our best modern embryologists have asserted that the nervous system, of which the first trace is visible close below the epiblast, is a festooning of the epiblast. In this view the outer covering of the body would give rise to the nervous tissue, the most active tissue of the body—the brain and spinal cord.

In the bioplasson view the impregnated germ is nothing but an amœba flattened out, as it were. We have an upper investment of the amœba representing the epiblast, and a lower investment, the hypoblast, while the main mass of the body represents the mesoblast.

In the amœba a so-called vacuole may appear temporarily, which is again enclosed by a thin layer of living matter, and we observe a closed space in the mesoblast—the first trace of the future heart. As in the amœba, the vacuole contains a number of isolated granules,—the first-formed blood-vessels, containing the blood-corpuscles. It is the mesoblast only which holds blood-vessels; the epiblast and hypoblast and their derivations will never show blood-vessels. In this view, therefore, the entire body is constructed of only four kinds of tissues, three of which, viz., the connective tissue, the muscles and nerves, arise from the mesoblast.

The connective tissue, among other functions, gives support to the whole body in the shape of the skeleton, and serves in the process of mastication in the shape of teeth.

The elements of the epiblast and hypoblast are called epithelia, investing the outside of the body and the cavities which are in direct or indirect communication with the outer world.

If you compare, gentlemen, the bioplasson doctrine and its consequences with what Beale has said, you will at once see the difference.

Beale claims that in the fully-developed organism the greater part, or, at least, a very large part, of the body is destitute of life. He asserts that the living matter is represented mainly by the nucleus, whereas the tissues are formed material, and not alive. He claims that the most active tissues of the body, such as muscles and nerves, are formed material. This is the very objection that Bastian has raised against the teachings of Beale. In my view, every tissue is alive except the horny material, epidermis, nails, and hairs. We cannot conceive of a part of a living body destitute of life. Even in the comparatively inert tissues of the body, in the connective tissues, the bone, and cartilage,—the whole is pervaded by a reticulum of living matter.

The new bioplasson theory suggests that there is the greatest amount of living matter contained in this mass. We readily understand by examining the muscle the reason why it moves; it is essentially upon the plan on which the amœba moves. The nerve-tissue, Beale suggests, is formed material. We say it is living material of a very concentrated form, and thus we understand and get an insight into nervous activity, which is based entirely upon the motion of this delicate reticulum. The new doctrine suggest a number of facts, so far in full harmony with all our observations. The connective tissue is characterised by the presence of what is formed or the glue-yielding substance. Not every variety is glue-yielding. Some of these substances seem like glue, and others, upon being boiled, give a gelatinous fluid, but not sticky; these are only special varieties of one and the same substance.

The new theory suggests that the inert basis-substance arises from the liquid present in the meshes of the bioplasson reticulum, which, although concealed in the basis-substance, remains unaltered.

The four varieties of connective tissue are the jelly-like myxomatous, the fibrous, the cartilaginous, and the bony. All these varieties have their representatives in the tissues constituting the tooth, and in the tissues attached thereto. The myxomatous tissue, the best representative of which is the umbilical cord, is present in the pulp of the tooth. The fibrous connective tissue, the best representative of which is tendon, being dense, firm and striated, we find about the tooth in the pericementum and periosteum. The cartilaginous tissue is not directly involved in the formation of the tooth, but it gives rise to the jaw-bone, and plays an important part in the formation of the jaws; while the bony tissue is of the greatest importance, inasmuch as it furnishes the sample of the structure which, with some variations, is found in the formation of the tooth.

As regards the bone-tissue, the idea was prevalent for a number of years that there were in it spaces filled with liquid, but nothing was known about the seat of life in the bone, for this reason: that a discrimination between the living and dead (necrotic) bone was impossible.

Virchow thought that the cells, which at that time were identical with the lacunæ, were the seat of life, although in his view the cells contained a liquid. With our modern views, it is hardly necessary to say that a liquid is never endowed with life. In 1870, in Stricker's laboratory, it was first found that the lacunæ of the bone-tissue held protoplasm. In our present views the bone is not only supplied with living matter, with plastids in the lacunæ, but also the offshoots of the lacunæ,—the canaliculi,—contain delicate filaments of living matter connecting the plastids; thus the bone-tissue is rendered an uninterrupted reticulum of living matter just as is any other tissue.

And now a few words concerning the minute anatomy of the teeth.

The manner of examining the tissues of the teeth in former times was like this: the tooth was allowed to dry; it was then split into thin laminæ by means of a saw; these were then ground down by means of a stone. In specimens thus obtained the lacunæ of the cement, the canaliculi of the dentine, necessarily looked black owing to the presence of a little air and some extraneous matter, but not the least idea could be obtained in this way as to the contents and the formations of living matter which enter largely into the construction of the tissues of the teeth. The first necessity, therefore, of research in the new direction was to devise a new method of preparing specimens for investigation, and this was found in the use of chromic acid for softening the teeth. This proved to be a powerful reagent for extracting the lime-salts of the tooth and for preserving, at the same time, its soft parts. It was introduced by H. Müller, in 1868, for preparing bone. All previous observers were satisfied to examine dry bone as well as dry teeth, forgetting that such dried material could not be useful for study, as it merely showed the frame of the former tissues, and not the tissues themselves. If, on the contrary, the soft parts be preserved and retained so as to be visible with high amplifications, they are in the best possible condition for the observation of new facts concerning their structure, which is the case with the specimens prepared by the use of chromic acid. Enamel, however, never could be softened by this means. For the study of enamel we took a freshly-drawn tooth, and, keeping it moist in order to preserve the soft parts, ground it thin by means of the way formerly adopted. The new facts obtained by this simple way are to-day well established.

All sensible Dentists must have been aware of life in the tooth; the simple fact that eating a sour apple would produce a certain effect upon the teeth—"setting them on edge"—has occupied the attention of thoughtful men for a long time. Some have spoken of the chemical action of the acid on the enamel, others of the conduction of the acid down to the pulp-chamber; but all that was unsatisfactory. Certainly every Dentist must have observed that the living dentine is endowed with a high degree of sensibility, especially in certain places; for instance, at the boundary line between the dentine and enamel at the neck of the tooth. Many other facts, the reaction upon filling, the so-called solidification around a filling, could not be explained by the former view. Tooth was considered to be cartilage with infiltrated lime-salts in which there are canaliculi, holding central fibers, the nature of which was not known. The enamel, even in the eyes of the best observers, was thought to be a crystal, a calcareous mass epithelial in its origin. The new researches show that the tooth is pervaded by a bioplasson reticulum in the same way as an amœba. It does not creep out of the mouth like an amœba, on account of the infiltration with lime-salts in the lifeless portion of the tooth, *i.e.*, the original liquid, which has become a solid basis-substance, while the reticulum remains unchanged, not only throughout the dentine, but also through the enamel.

We have learned, through the researches of Bödecker, that the fibers present in the canaliculi are living matter. These first had been depicted in Richard Owen's celebrated work by the draughtsman employed by him. In the picture we see the fibers, while no mention is made of them in the text. Tomes was the first to describe the fibers, and he thought they were probably nerves. This approaches our views, for we can prove living matter proper and nerve-tissue to be one and the same thing; and we can trace the ultimate fibrils of nerves to direct or indirect connection with the dental fibers. Any irritation of the dentinal fibrils is transmitted to the nerves which are present in the pulp-tissue.

It has been demonstrated that the so-called cartilaginous basis-substance is pervaded by a delicate reticulum, and although this cannot be directly seen, we have to assume its presence from facts obtained in the study of embryology, and in the study of the different appearances of the teeth in caries, as shown by Frank Abbott.

The enamel proves to be a live tissue, and supplied with a certain amount of living matter,—scanty, it is true, but in structure akin to dentine. Although its first stage is epithelial in nature, Bödecker's studies have shown that this epithelium is in turn changed into medullary tissue, which gives rise to the enamel—a complicated course which, however, is known to occur in the thyroid body.

The enamel-rods interlace in different directions, have interstices between them, and here is found living matter, which, as a reticulum, pervades the whole enamel. In the earliest formation of the tooth in the fetus, when the structure of the enamel is identical with that of the dentine, we can see the fibrils with great distinctness.

We have obtained an idea about the life of the enamel and the dentine, and, of course, the cementum ranks among the living tissues, as does bone.

The last question to be settled in this study was the nature of the pulp-tissue, and I dare say that to-day the character of this tissue is plain, both physiologically and pathologically. Dr. Bödecker's specimens have enabled me to say so.

In the light of the new views, Dr. Frank Abbott has studied the process of caries, and has shown that it is an inflammatory process which, owing to the scanty supply of living matter, is limited in its effect. While all tissues supplied with blood-vessels, if inflamed, produce something new, an outgrowth of new tissue, caused by increase of the inflammatory corpuscles (which are essentially the same as embryonal), in tissues destitute of blood-vessels, such as cartilage, the inflammation stops at a certain point, mere dissolution of the basis-substance takes place, the living matter reappears, but no outgrowth from the matter will occur. It has been proved that this process takes place in caries of the teeth. The first step in the process is that the lime-salts present in the meshes of the reticulum are melted out, the glue-yielding basis-substance is liquefied by means which we do not fully understand, and then the reticulum is re-established. The whole decalcified mass, still endowed with life to a certain extent, at last divides into medullary elements. Here is a stand-still, and new formation of living matter does not take place. The soft material becomes the seat of growth of leptotrix, and represents a decayed mass, which, constantly irritating, leads to a continuance of the caries.

The next important fact, theoretically at least, is the inflammation of dentine in its middle and inner portions, inducing secondary dentine, which Dr. Bödecker has shown to be of regular occurrence with advancing age or whenever irritation takes place. He found that this irritation, proceeding from the periphery to the center, led to a new formation of the tissue, which was proved to be secondary dentine in its three main varieties: with irregular canaliculi, with laminated structure, and structure kindred to bone.

Our specimens demonstrate that the secondary, like the primary, dentine is permeated by living matter, which, by a process of inflammation starting in the pulp-tissue, breaks down into medullary elements in globular fields or territories.

A subject which has been studied for two years in my laboratory by Frank Abbott, but which is not yet fully ripe for publication, is that of the melting of the enamel, caused by the same process which melts down the cementum and the dentine in deciduous teeth. There is in Tomes's book an illustration which shows that such a melting of enamel does take place, but, as we trust only to our own observations, we must postpone everything concerning this branch of the subject until we have trustworthy specimens. What we have seen is that a process of melting occurs on the plan of a slow inflammation; first, a liquefaction takes place in the basis-substance; afterward, decalcification, and then dissolution of the glue-yielding basis-substance. Thus the living matter becomes freed. Abbott found peculiar excavations, which are the territories of the tissue of the cementum. Kölliker, in 1874, first drew attention to such excavations on the surface of growing bone. At that time nothing was known as to the presence of living matter in cementum, and we should not be surprised that he was of opinion that these excavations and the bodies seen in them were something penetrating from the outside. So great was his respect for these bodies that he gave them the name of "bone-breakers." Reference was made by him to the melting process in temporary teeth. What we have seen does not confirm this bone-breaker theory at all. We say that the lacteal tooth, so long as it is connected with the soft surrounding tissue, must be endowed with life; therefore, the appearance of excavations filled with bioplasson is nothing but the reappearance of the original embryonal condition. The more surprising fact is that from this newly appearing tissue filling the excavations of lacteal teeth regular bone may arise.

Some of you have been accustomed to work upon the enamel as if it were worthless stuff,—calcareous matter void of sensibility. My studies, although theoretical, I think, have some value to the Dental practitioner, in having demonstrated that all dental tissues are alive, and I cannot believe that the removal of any part of these tissues can be done with impunity. The punishment will come, sooner or later, if you deprive the tooth of its best protector,—the hard, solid enamel.

Dentine, apparently an inert tissue, reacts upon everything we do with it; a perfect revolution takes places in the dentine if you fill a tooth with any material. You have to regard the conditions surrounding the filling and the reaction which will follow upon its introduction, and much depends upon how you do your work and the material which you use as to what this reaction will be—whether beneficial or the source of new suffering to the patient.

I announced a year ago that, from my theoretical stand-point, I should not insist upon filling temporary teeth with gold. I was misunderstood at the time. I did not mean that gold would do harm, but meant that it was unnecessary; in the lacteal teeth, so poorly provided with lime-salts, a slight protective filling does all the work one may expect.

NATIONAL DENTAL COLLEGE.

The Annual Distribution of Prizes to the successful Students of this Institution for the past year took place at the Beethoven Rooms, Harley Street, on the evening of May 31st, the Rt. Hon. Lord Viscount Enfield presided. The Dean's report was as follows:—

My Lords, Ladies and Gentlemen,

Four years ago the only Dental Schools where the whole of the special education of the Dental Curriculum was actually carried on were the two schools of this metropolis. Now there are seven institutions that have a complete staff of lecturers and teachers. Notwithstanding this rapid increase in the number of teaching centres, which speaks well for the educational advancement of the Dental Profession, the National Dental College has maintained a satisfactory position. During the past year there have been six full and thirteen partial entries; while three students have obtained the Dental qualification of the Royal College of Surgeons of England, three that of Edinburgh, and four that of Ireland.

Mr. Mountford, who last year won the Prize for Metallurgy, has further distinguished himself, and has to receive the Certificate of Honour for Dental Anatomy and Physiology, the Prize Medal for Operative Dental Surgery, and the "Rymer Gold Medal" for General Proficiency. Mr. Pidgeon, who has already carried off three Prizes and four Certificates of Honour, has been awarded the Prize Medal in

Dental Mechanics, and also in Dental Surgery. Mr. Hughes has to receive the Prize Medal for Dental Anatomy and Physiology, and the Certificate of Honour for Dental Mechanics, for Dental Surgery, for Operative Dental Surgery, and for the Elements of Histology. Mr. Penrose has to be presented with the Prize Medal for Metallurgy, and the Prize Medal for Dental Mechanics of Session 1882; the Certificate of Honour for each of those subjects to be received by Mr. Chas. Rose. Mr. Carter has been successful in winning the Prize for the best piece of Mechanical Work.

The changes that have taken place in the Staff of Lecturers are the resignation of Mr. Oakley Coles and the retirement of Mr. G. J. Williams. Losses such as these are keenly felt, because each of them has worked zealously and successfully for the School during the past five years, while their labours have been appreciated by their colleagues and highly valued by the Students. Mr. Willoughby G. Weiss has been appointed to the Lectureship on Dental Surgery, Mr. Harry Rose to the Chair of Dental Mechanics, and Mr. W. R. Humby has been elected to the office of Demonstrator of Dental Mechanics.

At the same time the requirements of the Examiners are fully and successfully met—for not one Student has failed—there is apparent the slowly advancing necessity of extending the sphere of Dental Education and Examination. And whatever direction this may take, the Staff of this Institution will ever be ready to co-operate, to the educational, intellectual, and professional advancement of the Specialty.

On the 30th of April, 1862, the Annual Distribution of Prizes to the Students of the Metropolitan School of Dental Science was presided over by the Rt. Hon. Lord Viscount ENFIELD. After 20 years his lordship again occupies the same position. It is a source of gratification that the Dental Profession, and the National Dental Hospital and College in particular, can include among their friends and patrons one who occupies so honourable and distinguished a position, and who has for so many years devoted so much valuable time to the Hospital as a Charity, as the right honourable nobleman who graces the proceedings of this evening.

The Prizes having been presented by the Chairman to the successful Students,

The CHAIRMAN said: Ladies and Gentlemen, it appears that it is expected of me to say a few words—and they shall be a very few words—before we proceed to the other part of this evening's programme, which will include, I hope, some very pleasant vocal and instrumental music. But I feel I should be wanting in respect to the gentlemen who have been so long connected with the National Dental College if I did not in my own name and, I hope I may say, in the name of the public, who have benefited so much by their kindness, by their skill and attention, return them our grateful thanks for the good they have conferred for many years past on suffering humanity. The Dean, in introducing the gentlemen who have received prizes this evening at my hands, was good enough to say that I have been for twenty-one years connected, as President, with this very valuable and useful Institution. I hope you will believe me when I say that I appreciate the compliment paid me very sincerely, and I am very glad to hear that although a few years have passed since that compliment was paid me, I feel proud of being President of so valuable and excellent an Institution. I have endeavoured every year to attend the annual meeting, and have listened to the report of the finances and the general mode in which the Hospital has been conducted, and I am bound to say, although a little addition to the funds by way of donations would be palatable, that this Institution has been conducted on sound and economical principles. But in addition to this, I thought, as my name was connected with this Institution, that I would look in and see the gentlemen at work, and on one occasion last year I spent nearly an hour at the Hospital, and I am bound to say that I was struck with the kindness and attention, and the aid which was afforded to the number of persons in the Hospital that morning. I have heard remarks by two or three persons who had been great sufferers and who have received benefits from this Institution. The words of one of them to me were: "If I had been the first lady in the land I could not have received greater attention than I have from the surgical and medical gentlemen in the Hospital." I think it is only right that I should mention this to the assembly this evening, and to return to the gentlemen my thanks for the kindness, skill, and attention that many have received at their hands. When I accepted the invitation to preside this evening, I made a stipulation that I should not enter into the professional part of these proceedings, because, perhaps, it might be thought impertinent on my part to speak on those subjects. I will content myself by expressing my grateful thanks for the compliment paid me many years ago in your allowing me to be connected with such an excellent Institution, and by assuring the gentlemen on the platform that they and others who have retired from the Hospital have done incalculable good in alleviating the evils from which humanity suffers. I hope the Hospital will continue to do as much good in the future as it has done in the past, and I thank them in my own name, and in the name of the public, for the good they have done for so many of their suffering fellow-subjects. With these few words I beg to thank you for the kind reception you have given me.

Mr. OAKLEY COLES: My lord, ladies, and gentlemen, when I tell you that the programme of this evening's proceedings was drawn up by our excellent friend the Dean, you will understand why what I propose doing now was not inserted in its proper place. I have the extreme pleasure in rising now to propose that the best thanks of the staff and those present, including those ladies who have charmed us with their presence this evening, be accorded to Mr. Gaddes for his services to this College. Unless you are acquainted with the work of this Institution it is impossible to form an idea of how much prosperity and success in all the details of efficient working depend on the labours of the Dean. The Dean is an officer to whom every one appeals for help and information, and in Mr. Gaddes we have a most excellent Dean. I have been compelled to resign my duties from failing strength, but before relinquishing my official position in connection with the Hospital and College, I want to record my deep appreciation of the services rendered by Mr. Gaddes and the obligations we are under to him for the capability and the great devotion he has shown to the School while he has held the office of Dean.

Mr. WILLIAMS : I rise with very great pleasure to second the motion. During the years I have been with Mr. Gaddes as lecturer at the Hospital I have found him to be all that Mr. Coles has said. I found him to be the right man in the right place; and I am quite sure the success of the College is due very much to Mr. Gaddes' exertions. I hope he will be spared for many years to carry on the work.

The resolution was carried.

Mr. GADDES : I feel very deeply the high compliment paid me by Mr. Coles and Mr. Williams, and you, ladies and gentlemen, in according me the hearty vote of thanks which you have done. It is a general practice to raise a monument to people who are dead ; and I hope not yet to give up this mortal coil, but for some years, at all events, to do my best for the Institution. I sincerely thank you for the compliment you have so heartily expressed.

Mr. RYMER : I beg to propose a vote of thanks to Lord Enfield for presiding. You have heard, many of you, that his lordship has taken a warm interest in the National Dental Hospital for a period of over twenty years. I have myself had the honour of being associated with Lord Enfield during that period. His lordship has himself stated that he has attended from time to time on public occasions and been present when the operations have been performed ; but I know he has been in the Hospital when apparently nothing particular has been going on, to look over the books. That is what we like. It is particularly gratifying to me, as Treasurer of the Hospital, to know that Lord Enfield has taken that interest in the Institution, and looked into affairs which are not, in all cases, so carefully examined as they should be. We are particularly indebted to our Chairman for attending here this evening when he has such a weight of anxiety upon him. We know Lord Enfield is connected with Her Majesty's Government, holding a high office; but, nevertheless, he does not hesitate to come amongst us to preside with the grace and ability that he has done over this meeting.

The CHAIRMAN: I am very much obliged to you, Mr. Gaddes, and to Mr. Rymer for the kind compliment you have paid me. I will not intrude longer on your time by making another speech. I thank you all very gratefully and kindly for the compliment you have paid.

An excellent programme of vocal and instrumental music was performed, much to the enjoyment of the audience.

ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

THE ordinary monthly meeting for the present Session of this Society was held at 40, Leicester Square, Mr. SAMUEL LEE RYMER, President, in the chair.

The PRESIDENT read a letter from Mr. George, the son of the late Mr. Charles Robert Darwin, acknowledging the receipt of the resolution passed at their last meeting, and expressing gratitude from his mother for the interest shown by the Odontological Society in so highly esteeming her husband's scientific works.

Mr. STEVENSON called attention to the advantage of steel springs. He said that having written a letter to the *British Medical Journal* on the subject, and having received many letters from Dentists as to how to obtain them, he thought it would be best to give them a satisfactory answer by asking the Society to allow him the privilege of showing his way of making them. This consisted in turning up the steel wire on an ordinary knitting needle in a turning lathe.

Mr. HUTCHINSON exhibited two contributions to the museum, one a model from Mr. Wilson, of Edinburgh, showing transposition of a canine into the place of a bicuspid, and a donation of specimens of salivary calculus from Mr. Whatford, of Newcastle.

Mr. TOMES announced some contributions to the museum for Mr. Hutchinson, Mr. Hutchinson not having seen them. The first was a leopard's skull with the teeth worn down; the next, a tiger's skull, showing the seat of an alveolar abscess, the animal probably having been wounded some time previous to its having been shot by Colonel Baldock, as a very large cicatrix was found on its tongue, therefore, Mr. Tomes thought that it was probably wounded by a bullet passing through its tusk, tongue, entering its jaw, and causing the abscess; these were from Mr. O'Meara, of Simlah, India. Also, from Mr. Tod, the skull of a dog peculiar for its having cut some perfectly white small incisors, in the process of eruption, in front of the mouth, at an extreme old age, the animal being about twelve years old. The next specimen was a lower wisdom tooth from a patient of Mr. Wallis; it had a deep groove at the apex of each root which evidently corresponded with the inferior dental nerve. The extraction was followed by paralysis of the parts supplied by the nerve.

Mr. COLEMAN thought that, with regard to the skull of the dog shown, it was a question whether the small teeth which had erupted might be regarded as part of a third set.

Mr. HUNT, referring to spiral springs, said that a friend of his, an able electrician, constructed springs of iridium wire, which answered admirably. He, Mr. Hunt, however, was anxious to teach them by his paper that spiral springs would be no longer needed.

Mr. HUNT then read his paper on CELLULOID. He said that the subject of mechanical Dentistry did not receive the attention of their societies that it deserved, considering the increasing number of well trained practitioners, and all the knowledge and skill that was put forth in staying various diseases; yet the mortal disease of the teeth still went on, and the forceps were still obliged to perform the last sad office to the diseased members. Practitioners were expected to do their best to supply the deficiencies thus caused, to enable their patients to masticate their food, and to put an end to a long train of discomforts, or even serious diseases, which were liable to arise from this cause. He considered that the idea that Mechanical Dentistry was beneath notice, was due to false pride. The study of an art which conferred such admitted benefits on our fellow creatures was, he contended, not beneath the notice of educated men, nor of a society whose aim it was to advance in every way the knowledge of Dental Surgery.

No subject had during the past few years excited more interest, or caused more disappointment than Celluloid. A base which should be strong, life-like, durable, on which artificial teeth could be mounted in such a manner that each individual tooth could be placed in the position best suited for the special requirements of the case, had long been a desideratum. It would be admitted by all that Celluloid was in appearance infinitely superior to any other base except continuous gum work. This latter was heavy, liable to fall in the mouth, and if broken or chipped, very difficult to repair. It required much time and skill in making, and the materials were costly, putting such a plate beyond the reach of many patients.

On the other hand it must be admitted that many serious difficulties were at first met with in the working of Celluloid. These were well summed up in a paper by Dr. Eben Flagg, published in 1879, and entitled "Why Celluloid does not succeed." He said, "If we go on working celluloid in the manner which we have been taught, it will be a failure, because there has been no apparatus that will fulfil the conditions required for the production of a perfect plate. These conditions are as follows :—(1) No steam, oil, or other foreign substance must be allowed to come in contact with the material whilst it is plastic, or it will discolour. (2) During the process of pressing, one portion of the blank must not be colder than another, or it will warp. (3) The material must have its form changed at a temperature much higher than is now used, otherwise it will have a tendency to return to its original form. This heat must be obtained in an apparatus that is air-tight, for if the super-heated material can obtain oxygen, either in the form of air or vapour, it will surely burn."

Mr. Hunt said that it was at the end of these remarks of Dr. Flagg's that he wished to begin, and that he would do so by bringing under their notice a machine which would fulfil all conditions that were absolutely necessary for success in manipulating Celluloid. The inventor had given demonstrations in working it, and to many of them present it was doubtless familiar; but for the advantage of those members who were not acquainted with it, a few rough sketches were on the wall showing its construction. This apparatus of Dr. Campbell's consists of a double boiler on an iron stand, heated by an ordinary Bunsen burner; it is provided with a pressure gauge and a thermometer. By means of this double boiler the inner dry chamber is entirely surrounded by steam or hot air, except in the front, where there is a glass door to enable the operator to see into the boiler as to whether his flask is closed, which is done by screws through the top. A very ingenious valve, which allows the operator to regulate the heat of the boiler, or let off the steam; also a special flask with pins, not tapered like the ordinary ones, but bevelled off. With the apparatus there was the means of obtaining an equal heat all around the flask of any degree required, and of maintaining it for any length of time, and, also, to remove the flask any instant desired.

For experiments he placed within the chamber a platinum capsule containing celluloid. Putting it to 90 lbs. pressure, that being about 331° of heat, and found in five minutes no change had taken place. He next put it to 100 lbs., equal to about 340°, it then began to swell; next, to 105 lbs., about 342°, for five minutes; it became more swollen, and bubbles began to rise and break, and at the same time vapour rushed out of it. Upon taking it out from the chamber it was found to be four times its original size, to be spongy, and had lost weight. Replacing it, and raising the heat to 110 lbs., or 145°, he found at the end of four minutes it decomposed, and nothing was left of the 30 grains but black particles which weighed a grain and a half. When decomposition occurred the thermometer registered 360° of heat, but he had reasons to believe that the temperature was higher.

Mr. Hunt next called upon Dr. Campbell to demonstrate, he having kindly promised to press home a Celluloid blank in five minutes, and in ten minutes have it ready to hand round.

Dr. Campbell very successfully fulfilled his promise by performing it in rather less time than he engaged to do it in.

Mr. Hunt, continuing, pointed out the advantage of using tin foil and working celluloid on tin models. He said results would be obtained which were unobtainable by the old method, and that the pressure required to close the flask by this apparatus was so small, doing away with the strength of an assistant to close it, with perhaps the result of breaking the teeth and model. The bevelled pins to the flask also enabled the Dentist to lock it permanently, and handle it without fear. By an intelligent use of the apparatus a whole catalogue of difficulties which have obscured the progress of Celluloid can be surmounted. Practitioners living in London enjoyed great advantages in obtaining early information of all improvements, and to many of those present the subject of his paper might not be new; but there were so many, like himself, whose opportunities of learning were limited, that he hoped the favoured few would forgive him if he had wearied them in his attempts to benefit the many.

The PRESIDENT thought that Mr. Hunt's paper had been listened to with great interest, and was eminently of a practical nature.

Mr. FELIX WEISS thanked Mr. Hunt for his paper, but he should liked to have heard more of the material and less of the *modus operandi*. The apparatus was probably an improvement upon its predecessors, though the plan of moulding celluloid by dry heat was not novel. He doubted whether any apparatus would overcome what he believed to be inherent faults of the material—its tendency to shrinkage, to double and flake, and the difficulties of adding to, or repairing it. Then there was its tendency to change colour. It also wore away more easily than rubber, it would become frayed even by the action of the tongue. Rubber, as they all knew, would last twenty to twenty-five years without change, but he had not yet met with a celluloid plate that had been tested for half that time. On the whole, he could not see what was to be gained by substituting celluloid for rubber.

Mr. VAN DER PANT said that he had used the apparatus as made and supplied by the Dental Company. The first case, made in 1878, was a complete suction upper, and two months ago he saw it and there was very little difference in it, there being no shrinkage or warping, but the polish had worn off. Another case, a partial piece, which was fitted about two years ago, was lately still in working order; but from actual practice the failures almost equalled the successes.

Dr. WALKER said he should like to know from Mr. Weiss whether his experience of celluloid occurred by the "New Mode," "Best," Glycerine, or any of the other methods introduced. He had obtained a "New Mode Heater" in August last, and had used it constantly ever since with the most satisfactory results. Of course six months was too short a time to judge of the durability of the plates. There was one caution to be observed: celluloid plates must never be placed over old roots, they must all be extracted. He had strictly followed the instructions given by Dr. Campbell, and certainly they had met with success. He thought the colour did not retain its beauty.

Mr. G. J. Williams at first had many failures, but after a time he was more successful. He found celluloid did best in endentulous cases, but was liable to become much worn by attrition. Last year he replaced by vulcanite thirty celluloid plates of his own make, and should have been glad to have done the same for other patients if he could have ascertained their whereabouts. He was a stranger to the "New Mode."

Mr. Steele, of Croydon, said his previous experience of celluloid was the same as Mr. Williams's, and he had thought of abandoning it altogether. But since using Dr. Campbell's machine he had seen reason to change his mind. All the cases prepared with it had been successful, and he found that the celluloid had increased density, a better surface, and less liability to undergo change.

Mr. C. S. Tomes observed that though the opinions expressed had been favourable, they were based too much on general impressions and on the experience afforded by a very short trial. They were useful as far as they went, but he should like to hear some more exact data as to changes in the composition of the material, loss of camphor, its specific gravity before and after heating, its breaking strain, etc. If he had these, and the statistics derived from, say, fifty pieces which had been worn for a considerable time, he should feel able to form an opinion, but at present he was not convinced of its virtues.

Mr. Hunt, in reply, said he had not troubled himself about the chemical constitution of celluloid, he could only speak of the practical results obtained with it. Mr. Tomes's criticisms were true enough, but it would take six years, instead of six months, to obtain them. He thought that failures were due to the method of working the material. What had been stated by himself and other speakers that evening would, he hoped, be sufficient to induce others to experiment for themselves.

The President, in closing the meeting, remarked that they would adjourn for their holidays, but he wished to remind them that the 31st of October was the latest time for nominations to be received for new members not holding legal qualifications. Therefore, he thought they should make the fact known, and trusted the Press would notice the matter. One other thing was the meeting of the British Dental Association in Liverpool in August next, which would be the first meeting of the Association out of London, and he trusted one and all would make an effort to attend.

The meeting then adjourned till Monday, November 6th.

THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

The following letter, addressed to the Editor of the *British Medical Journal*, is not without interest:—

"Sir,—In your issue of May 27th, there occurs, in a leading article on the Royal College of Surgeons in Ireland, the sentence, 'But for this interest, and the money obtained last year from the rather questionable granting of some hundreds of dental diplomas, the College would be absolutely in debt.' As a few of the Fellows of the College express indignation at the phrase 'questionable granting,' and, as I consider that the course adopted by the College during the past year, and indeed for some time previously, fully warrants this phrase, I purpose to write a few words on the subject. About one feature of the granting of the dental diplomas there can be no question, viz., that a large sum of money has been realised to the College by this procedure. In the earlier years of this diploma-granting, matters had a greater show of decency than during the past year. Many highly respectable practitioners came up for examination at the beginning; but, before long, this source of income was exhausted. The capability for diploma-granting did not, however, cease, when ceased the candidates of acknowledged respectability. Druggists' assistants —nay, I am told hairdressers and others of that ilk—were received with open arms. The dental section of the Dental Board demurred, and exercised their right of veto, at the meetings of the Board of Censors, to exclude the chemists and druggists. Forthwith the right of veto was taken from them, and the Council took unto itself the admission of candidates to examination. These circumstances make many of the Fellows think that the honour of the College has been seriously impaired. If it be asked why this was done, the answer is, a certain section of the Council knew that the College needed funds, and, by hook or by crook, must get them. The Fellows at large were never consulted on this dental traffic, nor was the opinion of the Fellows of the College practising dentistry asked or taken. One thing is now certain; even of the hairdressers and druggists' assistants there is an end, and some other scheme must be evolved to meet any extraordinary expenditure on the part of the College. Unless such can be devised if extraordinary expenses are to be incurred, the day of general collapse is certain and inevitable.—I beg to remain, faithfully yours,

"R. Theodore Stack, F.R.C.S.I."

LEGAL PROCEEDINGS.

PROSECUTION UNDER THE DENTISTS ACT.

At Marylebone Police Court, on May 31st, Charles Smith, 94, Praed Street, was summoned by the Medical Alliance Association for falsely taking a name, title, or description implying that he was registered under the Dentists Act, 1878, and qualified to practise Dentistry under or by virtue of such Act. Mr. Pridham, solicitor, prosecuted. The defendant did not appear, and Mr. Dennis, a solicitor, said there was no Dentist of the name of Charles Smith at the address. A Mr. Mallan, who was registered under the Act, carried on business there.

Mr. Pridham said the case was of some importance. It was the first prosecution under the Act. The main objects of the Act were to obtain the registration of Dental practitioners and to prevent any one taking and using the title of or practising as a Dentist who was not registered. Any person not registered could not recover any fee for a Dental operation. At 94, Praed Street, there were the words, "Mr. C. Smith, Dentist," on the door, and the name "Charles Smith" appeared on the window. There were also announcements that repairs were done, old teeth remodelled, etc. The register did not contain the name of Mr. Charles Smith, of Praed Street, and he was liable under the Act to a penalty of £20.

Mr. Dennis said Mr. Mallan carried on business there, and that he was registered.

Mr. Lushington (the magistrate) asked whether Mr. Mallan was registered at that address.

Mr. Pridham replied that he was not, but appeared as at 173, Praed Street. They were now informed that Smith was a myth. The name and address of the registered person must be given.

Mr. Lushington said, as far as he could understand it, Mr. Mallan was carrying on business under a false name. He was of opinion that the attention of the Council should be directed to the question whether this was not disgraceful conduct, and whether Mr. Mallan's name should not be erased from the register. The summons would be adjourned for four weeks.

EXAMINATION PAPERS.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Examination for Diploma in Dental Surgery, June 19, 1882 :—

ANATOMY AND PHYSIOLOGY.

1. Describe the Palate-bone and its connexions.

2. Describe the branches of the third division of the fifth pair of Nerves, and specify the structures to which they are distributed.

SURGERY AND PATHOLOGY.

1. What is the process by which union of an Incised Wound is effected? How can this be best promoted?

2. What do you understand by a Dislocation of the Jaw? What force produces it? How would you reduce it?

DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe the positions of the Crypts of the several Permanent Teeth, and their relation to the Roots of the Temporary Teeth at the age of six years. State what Teeth, complete and incomplete, are found in the jaws at that period.

2. Give briefly the Situation, Function, and Minute Anatomy of the Tissues named respectively—Nasmyth's Membrane, Membrana Preformativa, and Membrana Eboris.

3. Give the Dental Formulæ of Man, Old-World Monkeys, and New-World Monkeys. Which Teeth of the typical Mammalian dentition are absent in them? In what respects do the Teeth of the higher Apes differ from those of Man?

DENTAL SURGERY AND PATHOLOGY.

1. In a case of crowded Teeth in a Contracted Arch, mention the points to which you would give attention in deciding between the Extraction of Teeth and the Expansion of the Arch. How would you effect the latter?

2. What is meant by Impaction of Teeth in the Jaws? Which Teeth are most frequently Impacted? and why?

3. What are the causes of Hæmorrhage following Tooth-Extraction? What methods of Treatment are commonly pursued, and what are their respective advantages and disadvantages?

ROYAL COLLEGE OF SURGEONS IN IRELAND.

Dental Surgery Examination, June, 1882:—

Examiner—MR. B. WILLS RICHARDSON.

1. What part does Diastase perform in the process of Digestion?

2. How is the great Sensitiveness of Dentine explained?

Examiner—DR. EDWARD A. STOKER.

1. Describe the Antrum of Highmore, giving boundaries, relation to Teeth, and exact position of principal opening.

2. Describe fangs and cusps of second upper Molar. With what Teeth is it in contact when mouth is closed?

Examiner—MR. JOHN H. LONGFORD.

1. What would be your treatment in a case in which two or three front Teeth have been knocked out by accident?

2. What is Borax, and its use in mechanical Dentistry?

Examiner—MR. E. STAMER O'GRADY.

1. In what position may Salivary Calculi be found? What are such formations, and state how you would treat the trouble?

2. What is meant by the expression "Salivary Fistula"? Where may the condition be found, and how is it best treated?

Examiner—MR. F. ST. B. TAYLOR.

1. What would be the consequences of Pivoting a Tooth with brass, or any other base metal?

2. Mention the different materials used in taking impressions of the mouth, and the method of application of each.

Examiner—MR. HENRY G. SHERLOCK.

1. Inflammation causing Death of Pulp, without Caries, in an Incisor Tooth—give its cause and treatment.

2. Fistula in lower jaw—causes and treatment.

PASS LIST.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

THE following gentlemen having passed the required examination on the 19th, 20th and 21st ult., were admitted Licentiates in Dental Surgery:—

A. W. G. Barnard.
A. F. Baudry.
H. G. Blackmore.
A. L. Curle.
W. Harrison.
A. A. Matthews.
A. H. Mountford.
H. G. Read.
Alfred Slate, M.R.C.S.

One candidate failed to acquit himself to the satisfaction of the examiners.

SCOTTISH DENTAL ASSOCIATION.

A MEETING of members of the British Dental Association was held on June 13th, in the Dental Hospital, Chambers Street, Edinburgh, for the purpose of considering a proposition to establish a branch of the Association in Scotland. Dr. J. Smith presided, and explained that as there were at present in Scotland two societies devoted to the scientific and literary interests of the Profession, the proposed branch would be left free to attend to the conservation of their rights and privileges.

Mr. W. B. Macleod moved, "That it is desirable that a branch of the British Dental Association be established in Scotland." Mr. Watson seconded the motion, which was unanimously carried. Dr.

Reid, seconded by Mr. Wilson, moved that the branch be constituted. The meeting then resolved itself into a committee, and adjusted a set of bye-laws. The chairman was elected President; Mr. Campbell, Dundee, Vice-President; and Mr. W. B. Macleod, Secretary.

READING PROVIDENT DISPENSARY.

REPORT FOR 1881.

THE number of patients entitled to attendance at a small charge during the year 1881, was 13,881, being about one-fourth of the total population of Reading. The Dental cases attended for that number of patients has been 553, being cases of extraction, advice, etc., only. No extra payment is made for Dental attendance. I particularly mention this in consequence of some correspondence which reached me when I presented a former report.

GEO. LYDDON, L.D.S.Eng.,
Hon. Dentist.

BICHROMATE OF POTASH NECROSIS.

PHOSPHOROUS, in the form of vapour, is not the only substance that may produce necrosis. Similar effects upon workers in a bichromate of potash factory in Russia have been noted. The part attacked is the septum of the nose. The early symptoms are a slight tickling, followed by bleeding, but with no very uncomfortable feelings. Perforation of the septum ensues, and, after a time, the partition disappears entirely. The destructive process is painless. Some of the men have been employed for ten years without being affected, while others are attacked in the first month. But that the disease is somewhat more than an individual peculiarity is evident from the fact that an inspection of all the hands proved that more than 50 per cent. of the men had diseased noses.

OBITUARY.

JEAN EVRARD.

M. JEAN EVRARD, the well known and highly esteemed Dental and Surgical Instrument maker, was found drowned in the Regent's Canal, on May 28th. He had entertained the delusion that he would be punished for cutting up some valuable books; and, on the morning of the 23rd of May, he was said to be quite mad. He disappeared that evening, but his body was not found until Sunday, the 28th. He was a most skillful workman, and a Frenchman by birth and education. His age was 75 years.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

THE LIMITATION OF DENTAL SURGERY.

To the Editor of the DENTAL RECORD.

SIR,—I have read, with interest, the discussion upon the paper read by Mr. Gaddes at the Meeting of the Odontological Society, on the removal of a tumour from the upper jaw of a patient; and, also, as to the qualification of the Dental Surgeon to perform such an operation. I quite agree with Mr. Gaddes that such operations fall within the province of the Dental Surgeon, and that many other operations which are performed in the mouth by medical men would frequently be better performed by the Dental Surgeon. A case came under my observation a short time ago, where a young surgeon, holding an hospital appointment, found it necessary to excise a patient's uvula. The patient was put under the influence of ether. When in the anæsthetic state, the operator had great difficulty to open the mouth; and, when that was accomplished, he could not keep the tongue out of the way, and, after fishing about for about half an hour, was compelled to allow the patient to partially recover consciousness, and then take a dash at the uvula, and so injuring the soft palate, that the patient's condition afterwards caused considerable anxiety.

If this operation had been performed by a Dental Surgeon, instead of giving ether, *i.e.*, if an anæsthetic were necessary, he would have given gas, and would have gagged open the mouth previous to administering the anæsthetic, and from his special anatomical studies would have better understood the muscles to be overcome. This is only one case, and I have no doubt many such cases occur.

An article in the *British Journal of Dental Science* of last month tries to define the line of demarcation between General and Dental Surgery. I believe it is difficult to draw that line; for instance, I consider it impossible for a man to successfully treat Dental diseases without having recourse to the use of medical remedies; and who should be better able to administer them than the Dental Surgeon? I consider it absurd for the Dentist to send the patient to a medical man for treatment. In the first place it is an injustice to the patient, by causing him to pay two men instead of one; and secondly, the patient looks upon the Dental as the inferior of the medical practitioner. Would an occulist, if he found medical treatment necessary before operating upon his patient, send him to a medical man for treatment? Or would a Surgeon who has amputated a finger send for the Physician to prescribe a bottle of medicine to give the patient relief from pain? No! Then why should a Dental Surgeon send his patient to a medical man for that special Medico-Dental treatment for which the Dental Surgeon is supposed to be specially educated. Moreover, what is the use of the Dental Student going through the various courses of medical education, and attending the practice of a general hospital, if, after all his lectures in Medicine, Materia Medica, Anatomy, Chemistry, and General Surgery, he is considered only competent to pull out a tooth, fill a decayed one, or fit artificial teeth? If this is the sum total of a Student's qualification, I consider his General Hospital Curriculum an absolute waste of time, and better had we remained simply Dentists, than be the hangers-on of the Medical Profession.

Again, in the *British Journal of Dental Science* of the 15th, in an article under the head of "Warning," says, "that in all cases of anæsthesia a doctor should be in attendance." What for, I should like to know? To do this it would impose a tax upon our patients which, as men practising a liberal profession, we have no right to impose, and would convert a very useful and necessary surgical remedy into a luxury attainable only by the well-to-do classes. In nine cases out of ten the doctor knows nothing more than the Dentist ought to know, and frequently he knows a great deal less about anæsthetics, and especially nitrous oxide gas; and how many full fledged medical men ever performed the operation of Tracheotomy, or know how?

There are good men in the Medical Profession, but because a man has the M.R.C.S. that is not a guarantee that he is better qualified to treat special diseases, or administer anæsthetics. I know a number of medical men who have no knowledge of anæsthetics. I give a case. I was suffering from an attack of acute ostitis, and wished to have nitrous oxide gas for the extraction of a tooth; I asked a personal friend, a medical man, would he give it to me. His answer was, "My dear fellow, I am sorry for you; but, to tell you the truth, I am afraid I don't understand much about anæsthetics." And yet, according to the editor of the *B.J.D.S.*, if I wish to give a patient the gas, I must call this man in, and stand aside while he, simply because he is an M.R.C.S., is the only person legally qualified to give the anæsthetic, and I, who have spent years in studying a special disease and the administration of a special anæsthetic, have simply to pull out the teeth, a mechanical operation, which, I maintain, does not require several years' hospital practice, and lectures in Medicine, Materia Medica, or general Surgery.

I should like to see the Dental Profession stand upon its dignity, and not like a poor, delicate infant, always be hanging to the skirts of its nurse, "The Medical Profession." If we wish to be respected by the public, we must first respect ourselves, and take a definite professional standing. If we are qualified to treat Dental diseases, we are qualified to administer those remedies which are necessary for that purpose. If we are not qualified for this, then the Medical Education of the Dental Student is a farce.

Dudley. J. W. ROBERTS, L.D.S.F.P.S.Glas.

THE LATE FATAL ACCIDENT AT PRESTON DURING TOOTH EXTRACTION.

To the Editor of the DENTAL RECORD.

SIR,—Whilst sympathising with Mr. Miller and with the parents of the child who died during the operation, I should like to offer a suggestion which may possibly prevent a similar sad accident in future. It is simply to have a number of small sponges in readiness, each attached to a thin piece of bamboo (I use the outside laths of the cheap Japanese fans). These throat brushes, as I call them, are used by an assistant for pressing aside the tongue in operations on the lower jaw, thereby giving a clear view of the situation of the teeth to be operated on, removing blood and mucus from the throat, and preventing to a great extent after-sickness, and, most important of all, being in perfect readiness to catch any tooth that may slip from the instrument.

By the way, it would be interesting to know what the condition of the child's mouth was, to call for the extraction of such a large number of deciduous teeth. Mr. Miller says that "nine of the temporary teeth were obstructing the eruption of the permanent ones;" now, I suppose that the nine deciduous teeth would have been extracted if the accident had not occurred. I should like to protest against the wholesale extraction of the deciduous teeth which is going on. Probably Mr. Miller can explain why so many teeth had to be removed; and I hope he will do so, because others will think as I do, that it was rather heroic practice. I may just say that during a long experience of private practice, and also some years' attendance on the children at an orphanage, I have never met with a case that required the removal of so large a number of the teeth of the first set at one operation.

Yours very truly,

Hillary Mount, Leeds. GEORGE BRUNTON.

To the Editor of the DENTAL RECORD.

SIR,—I have read in the RECORD of the 1st inst., and also in the *British Journal of Dental Science* of May 15th, the account given by an eye-witness of the late fatal accident at Preston. The writer winds up by hoping that it may act as a warning to others.

Now, I should like to know, what we are warned against. From the evidence of all parties, the patient took the gas quietly, and all went well up to the end of the operation. At the *post-mortem* a tooth was found in the windpipe!

Had the patient struggled very much there might have been something to learn, but it was not so; he was quiet as a lamb.

What are we warned against?

A caution against letting teeth slip down little boys' throats whenever they take the gas savours too much of the moral at the end of an "Ingoldsby Legend" to be of practical use. An idea! Why not have endeavoured to prolong life by performing the simple operation of Laryngotomy, instead of waiting for a doctor to perform Tracheotomy when the patient was dead?

Yours, &c.,

June 9. SURGEON.

Editorial.

THE CONJOINT SCHEME.

THE Medical Acts Commission, appointed on the 2nd May, 1881, has just issued its Report. The Commissioners propose that there shall be a Divisional Board for, and representing the Medical Authorities of, each of the three sections of the United Kingdom. The Divisional Boards shall appoint a certain number of persons to be members of the Medical Council. The Divisional Board of each division shall conduct the examinations for the license to practise Medicine, Surgery, and Midwifery. This license of the Divisional Board shall be the necessary certificate for admission to the Medical Register; and the right of admitting to the Medical Register, together with general control over the proceedings of the Divisional Boards, shall vest in the Medical Council. While the certificate of a Divisional Board will, in future, of itself confer a right to registration and practise, it is hoped and believed that medical men will not be content with that bare license to practise, but that they will continue to seek to belong to one or more of the Universities or Medical Corporations. To the higher titles of those Authorities the Commissioners attach the greatest value, as a means of encouraging the acquisition of knowledge and skill in the Medical Profession. All titles now registrable, or hereafter to be recognised by the Medical Council, shall continue to be registrable; and a column shall be set apart in the Register for the Registration of the higher titles recognised by the Medical Council as indicating substantially higher medical qualifications than will be required for a license to practise.

The foregoing conditions are the general terms of the Report, which does not refer to or embrace Dental Surgery as a specialty.

The President of the Association of Surgeons Practising Dental Surgery appeared before the Commissioners, and asked that qualified Dentists not on the Medical Register should be prevented from styling themselves "Surgeon-Dentists"; but they did not see their way to make such recommendation. The British Dental Association also asked for direct representation upon the Medical Council; but that request was recommended not to be granted.

This is the latest aspect that the Conjoint Scheme presents.

GOSSIP.

Broca's tables of craniology, including upwards of 1000 of his own observations, were being revised by himself at the time of his death, and the further revision of them has been intrusted to M. Paul Topinard. He has been led to conclude that excessive weight of the brain cannot, *primâ facie*, be accepted as an evidence of great intellectuality, but may fairly be assumed to depend upon some cerebral abnormality. Thus he is of opinion, that even in the case of Cuvier's brain, whose exceptionally large weight (1829 grammes) has long made it rank among cerebral marvels, the well-attested presence of hydrocephalus during the infancy of the great naturalist was not without influence on the subsequent cranial enlargement. Finally, he believes that we are justified in assuming that a well organised brain will not *very largely* exceed the mean, having due reference to age, sex, and stature. From Broca's tables we obtain a cerebral mean of 1325 for men generally, and of 1142 for women generally; the greatest weight among the former being attained between the ages of thirty and thirty-five, and among the latter, somewhat earlier. After the age of fifty-five, the diminution is rapid, and at the age of eighty it has reached the mean of 100 grammes, although the loss sometimes amounts to 250 grammes. The means for the prime of life are 1421 for men, and 1269 for women. The great desideratum of modern cerebral inquiry is the careful determination of the difference of the weight of the brain among mentally sound individuals belonging to the two distinct classes of those who are engaged in intellectual pursuits, and those whose vocations demand great muscular activity. Broca considered that form was more important than weight in estimating intellectual capacity, which possibly depends upon qualitative, and perhaps chemically inappreciable, rather than mere quantitative, relations.

At the Berlin Physical Society, Prof. Christiani showed samples of a new method of preservation of organic bodies, they having been coated galvanoplastically. A mulberry leaf, a crab, a butterfly, a beetle, the brain of a rabbit, a rosebud, and other objects, were silver, gold, or copper-plated, and showed all details of their outer form, down to the finest shadings, very well preserved. As to the process (which is patented by the inventor), it was stated that the objects to be preserved, being put, living or dead, into a solution of silver nitrate in alcohol, then dried, and treated with sulphuretted and phosphuretted hydrogen, form good conductors, which, brought in the usual way into the galvanoplastic bath, can be coated with any desired thickness of a metallic deposit.

A NEW method of mining coal has been devised by Mr. Mosley, of London, which avoids all the risks that are inherent in the usual system of blasting. The method has been in use for several months at the Shipley collieries, Derbyshire, and consists in the use of a cartridge of lime instead of gunpowder or dynamite—the expansion of the lime when slaking being utilised for forcing down the coal, thus avoiding the dangerous flame from the explosion of gunpowder. The lime is in a highly caustic state, and after being ground to a fine powder is consolidated under a pressure of 40 tons to the square inch into cartridges of 2½in. diameter, with a groove on one side for the admission of the water-pipe. The shot holes are drilled by means of a light boring machine, and an iron tube about ½in. in diameter is inserted first. This tube is perforated, and is inclosed in a calico bag, which covers the perforations and one end, the other being closed by means of a tap. This pipe, it will be understood, fills the groove in the lime-cartridge, which is inserted after the pipe and lightly rammed. The hole is then tamped in the usual way, and a small force-pump is connected by means of a flexible tube. Water equal in bulk to the lime is then forced in, it escaping at the inner end of the tube and from the perforations: the steam generated by the action of the lime on the water cracking the coal away by the high pressure it reaches. After the steam has exerted its effect, the expansion of the lime comes into play, and the force exerted is sufficient to bring down the coal in large masses.

IT has been proved that caoutchouc is highly absorbent of certain gases, especially the light-yielding constituents of coal-gas. In a recent note to the Berlin Chemical Society, Herr Hempel shows, from experiments, that its absorption of carbonic acid and nitrous oxide, though small, is such as to forbid its use in some very exact gas analyses. The absorbent power may be shown to an audience by connecting a carbonic-acid generator, or nitrous oxide gasometer, by means of a long caoutchouc tube with a glass tube, which is inserted in coloured water. All air having been driven out by a strong current of the gas, and the admission of gas stopped, the coloured liquid gradually rises in the tube, indicating gas absorption. Herr Hempel says that caoutchouc stoppers, tubes, etc., which still retain full elasticity, may be kept long from deterioration if placed in a glass case (hermetically sealed) along with an open vessel of ordinary petroleum. Keeping in wooden boxes is bad; so is exposure to light. Old stoppers that have become hard may be softened very quickly by placing in a vessel with sulphide of carbon vapour. In course of time this action proves too strong, and the caoutchouc should be likewise brought into petroleum vapour.

Dr. Regnard has lately conceived the idea of getting a bright light by burning on platinum gauze a mixture of air and petroleum vapour. The intense heat which results raises the platinum to bright incandescence, giving a light equal to about half the lime-light. The apparatus is very simple. There is an ordinary Bunsen burner, terminated by a small cage of platinum wire. The mixture of air and petroleum vapour is admitted below, in place of the gas. The petroleum is placed in an ordinary wash-bottle, and a current of air is forced through it by means of a pair of bellows. The vapour may be received into a large bag or other reservoir. The aspect of the light is that of an electric incandescent lamp. To send all the light in one direction, the Bunsen burner may be fitted with a bent trumpet-shaped nozzle closed with platinum gauze. One has merely to regulate, with the ring of the burner, the admission of the mixture of air and vapour, to have an extremely bright light. Benzolin may be substituted for petroleum.

MM. Hautefeuille and Chappuis have recently obtained liquid ozone in the form of liquid drops, of a deep indigo blue colour. The liquid could be kept nearly thirty minutes under a pressure of 75 atm. Its vaporisation is not very rapid, even at atmospheric pressure. The liquefaction was effected by compressing, at about 125 atm., a mixture of oxygen and ozone in one of M. Cailletet's tube-shaped vessels, which terminates above in a capillary part bent downwards. This descending part was exposed to a jet of liquid ethylene, a new method whereby M. Cailletet gets temperatures as low as—105° C. The blue coloration is very distinct in the cooled part. On releasing the pressure the tube becomes instantly colourless, but a dark blue liquid drop remains at the end; this liquid ozone may be examined either through liquid ethylene, or by momentarily removing the cooled tube from this liquid.

A very interesting and easy method of examining the circulation of the blood in the tadpole's tail, is to take a hollow slide, or make a little trough by converting four little strips of glass on one of the 3-in. by 1-in. slips, so as to make a shallow cell of such a size as will contain a tadpole, covered with water. After placing the tadpole on its side in the cell, and covering with water, drop a small quantity of chloroform over its head. Let the quantity of chloroform be very small, and rather add to it if after a few seconds the tadpole is not quieted. The tail ought to be examined carefully for the best part, and with a little search a place may be found where both a vein and an artery are in the field at one time, showing in the artery the regular pulsation, and in the vein the steady flow of blood, the pulsation being lost in the capillaries.

Mr. Coleman's recent book on Dental Surgery has been thoroughly revised and adapted to the use of American students and practitioners, by Thomas C. Stellwagen, M.A., M.D., D.D.S., Professor of Physiology at the Philadelphia Dental College. The *Dental Register*, in noticing the revised edition, says, "This old, well known manual of dental surgery to the British practitioner, has been greatly enlarged and improved in its revision for the American edition. The notes and illustrations added by Professor Stellwagen serve to give it a value it would not otherwise have had, bringing the newer and most important facts and discoveries of the last few years into notice. The manual, without revision, shows well how widely the dental practice of England differs from that of America, and hence the necessity for the descriptions 'of modes of treatment demanded by the peculiarities of climate,' as well as 'the latest and most approved systems of operating.'"

The Astronomer Royal showed before the Royal Astronomical Society some enlargements from photographs of sun-spots, which had been obtained at the Royal Observatory. He said it was remarkable that the first group appeared on the 13th of April, and three or four days afterwards a great magnetic storm occurred. There was a smaller group of spots also, which, on the 17th of April, burst out suddenly, the group rapidly becoming nearly as large as the other group. Following this, on the 19th of April, there was another violent magnetic storm, lasting about 24 hours. A double outbreak on the sun, and two magnetic storms following with such coincidence, are interesting facts.

Although a few links are still wanting to complete the chain of the life-history of the eel, it may be most safely assumed that the eel lays its eggs like the majority of fishes, and further, that, like the lamprey, it only spawns once and then dies. It would also seem most probable that the spawning takes place only in the sea. Eels placed in land-locked ponds, though they increase in size, never, it is well known, increase in numbers. The most important problem still to be solved is, do the male eels ever leave the sea and enter fresh water?

A man swallowed a case of four artificial teeth during sleep on the 5th of July, 1880. As the teeth were lodged in the œsophagus, he could swallow only small portions of liquid nourishment, which occasioned severe pain. On the 7th of February, 1882, the plate was ejected by vomiting, after it had been lodged in the œsophagus nineteen months.

A PIECE of American pork in Havre, found to contain cysts of trichinæ, was put in fine salt in a vessel which was then kept hermetically closed for a year; add to this the time elapsing from its original preparation, and we have about fifteen months of salting. M. Fourment took small pieces of this lard, and after soaking them some time in water, gave them to mice. The animals fell ill and died, and trichinæ of both sexes were found in their intestines. Thus, in salt meat at least fifteen months old, these parasites may continue alive and capable of development.

To produce the sensation of smell, a substance must, according to the recent theory of Mr. William Ramsay, have a molecular weight at least fifteen times that of hydrogen; and the intensity of smell increases with the rise of molecular weight. The period of vibration of the lighter molecules is too rapid to affect our sense; and just as some persons have the power of hearing more acute sounds than others, so some senses of smell are limited by a specific gravity of 15, and cannot smell prussic acid.

A NEW lamp combining gas and electricity is said to give good results. A small strip of platinum foil is so arranged in connection with the burner that when the gas is ignited the platinum becomes heated, and then offers so much resistance to a current of electricity that it becomes incandescent, and in turn heats the gas to a high temperature. It is stated that a light equal to thirty candles can be obtained from two cubic feet of gas per hour when a small current is used in aid.

PROF. ROBERTS has repeated and confirmed many of the experiments of M. Spring, whose more recent results are of special interest, as he has shown that if fillings of bismuth, lead, and cadmium be *mixed* in suitable proportions, such, for instance, as in Wood's alloy; and if the mixture be submitted to a pressure of 7500 atmospheres, an *alloy* is obtained which will actually fuse at 70° C. the true fusing point of Wood's alloy being 63° C.

A GENTLEMAN, 72 years of age, recently went down to the beach at Southsea to bathe, and was found shortly afterwards floating on the water face downwards. On examination it was found that his artificial teeth had become displaced, and had blocked the windpipe, causing death from suffocation.

Cats receiving arsenic in small doses from time to time, eat more, and fatten, for a time, showing every sign of good health. But by-and-bye they grow lean, have diarrhœa, lose appetite, and become languid: and they die in an anæmic and lean state, there being fatty degeneration of the lungs, and mesenteric glands.

The Aëronautical Society of Great Britain proposes to hold next year an exhibition, similar to the one held in the year 1868 at the Crystal Palace, with the object of ascertaining the position of the science of aëronautics, and with the view of affording an opportunity to inventors to embody and exhibit the results of their labours.

The total receipts from subscriptions, entrance fees, etc., to the International Medical Congress, amounted to £9,030. About half that sum was spent in the publication of the "Transactions." After paying all other expenses the sum of £300 remained in hand, and this was paid over to the new Research Defence Association.

Alcohol absolutely free from water does not dissolve permanganate of potash, and, therefore, remains colourless if this substance is added to it. Few alcohols will be found to stand this test, as even alcohol absolutely free from water will soon absorb enough from the atmosphere to dissolve some of the permanganate.

Mr. Edwin Saunders, F.R.C.S., will preside at the Annual Distribution of Prizes to the Students of the Dental Hospital of London, to be held at Willis's Rooms, on Thursday, the 6th inst., at 6 o'clock p.m.

W. F. Cornelius has been appointed Assistant House Surgeon to the Dental Hospital of London.

Prof. Draper believes that he has evidence of the process of aggregation, or of condensation of nebulous matter into stars.

Communications.

Communications have been received from J. W. Roberts, Dudley; Alfred Slate, London; George Brunton, Leeds; W. J. Pidgeon, Rouen; Parsons Shaw, Manchester; George Lyddon, Reading; H. Kyan, Preston; W. F. Thompson, London; W. F. Cornelius, London; J. James Bailey, London; Gurnell Hammond, London; Surgeon; &c.

Books, &c., Received.

"Dental Anatomy," C. S. Tomes; "Journal of British Dental Association;" "Dental Cosmos;" "Dental Register;" "Southern Dental Journal;" "Zahntechnische Reform;" Annual Announcement of Dental Department of University of Maryland; Medical Acts Commission Report; "El Progreso Dental;" "Revue Odontologique;" "Medical Record;" "Sanitary Record;" "Edinburgh Courant;" "Chemist and Druggist;" "American Journal of Dental Science;" "L'Odontologia;" "L'Odontologie;" "Progrès Dentaire;" "Missouri Dental Journal;" "Items of Interest;" &c.

THE

DENTAL RECORD.

VOL. II. AUGUST 1, 1882. No. 8.

OPERATIVE DENTAL SURGERY,

Being part of a Course of Lectures delivered at the National Dental College, London,

By W. FINLEY THOMPSON, M.D., D.D.S.

(*Concluded from page* 294.)

HERETOFORE I have been unable to avoid Pathology, or to entirely dismiss Therapeutics; and it will now be necessary to recapitulate, owing to the intimate relationship of Operative Dentistry to these two sections.

The causes which are found to operate adversely to a normal state of health will also act as an impediment to the full and perfect functional activity of any organ in the economy; and the teeth are not exceptions to this rule.

Peculiar formations of teeth undoubtedly do accompany certain temperaments; but this assertion is only made with the same relative accuracy with which mathematical terms are used in anatomy, and cannot be considered arbitrary. Nature delights us with surprises and exceptions, which, though seemingly anomalous, prove to be but the exponents of a law more remote than we had at first suspected. Every healthy organism has its parts co-ordinate, and each individual economy an established law harmonious to the system of the universe. The differences of feature which distinguish people from each other are unmistakably impressed upon every portion of the frame, including the bones and the teeth.

The maxillæ may be considered as intimately connected with: 1st, physiognomy; 2nd, physiology; and 3rd, temperament. The configuration and the relation to each other of the upper and lower jaws, together with the structure, form and arrangement of the teeth implanted in them, are conditions which essentially determine the functional worth of the teeth and masticatory apparatus. In the well formed arch, with strong regular teeth in constant use, as in the lower races, little or no caries will be found. In crowded and irregular arches, with ill formed teeth and diminished activity, there is marked disposition to and prevalence of caries which brings about impaired mastication, and, as a result, imperfect digestion. These instances will serve to briefly illustrate the relationship between the systematic formation of these parts, their functional use, and the diseases to which they are subject. The massive square jaw will be found to contain the more circular and expanded dentitions, which may be traced through an infinite succession of phases, until the extreme is reached of the narrow maxillæ and overhanging cerebral development of the melancholic or encephalic temperament. The differences blend imperceptibly from the extremities of the scale, and, although diametrically opposite, at points have so much resemblance that some approach to a system of classification might be made. As, in music, the vibrations pass into each other by degrees imperceptible in themselves, until a note, or a portion of a note, becomes so pronounced that it receives a name, and can be borne on the memory, so do we find a law analogous to this in the human species—differences expressed in ordinary language and understood by the masses, while medically they are distinguished as temperaments. In calling attention to the different temperaments, I shall endeavour to give you a classification by which to distinguish disease as manifest in the teeth.

It may be questioned, what special reason is there for introducing the subject of temperaments here? and in what manner, directly or indirectly, does it bear upon Operative Dentistry? Very much depends upon the intelligent manner in which remedies are applied, and a most valuable adjunct to diagnosis, where the diathesis is somewhat obscure, lies in a discriminating power to trace cause to effect through a knowledge of certain influencing tendencies in temperament. From the natural reticence of those who apply for relief, it is necessary to have some independent means by which to establish an opinion as to the resistance or susceptibility of disease in any special organ—conclusions that can only be formed by examinations that will give a ready insight into the economy. This may prevent the employment of incompatible materials for filling, which otherwise would ultimately prove a cause of adverse criticism, resulting, not from any lack of care, but from palpable error in judgment. Especially is this the case with young children, and the subject of calcification or disintegration of the teeth with advance of age is one worthy of earnest investigation. Here the subject of temperaments will greatly aid you, as it is not the present state which alone requires attention. Disease existing at the moment may be clearly traceable; but the treatment best calculated to insure permanently beneficial results must come from a just appreciation of the condition of the system as influencing the teeth, and any practical benefits otherwise conferred must in a measure be considered empirical.

The ancient reasons given for the temperaments are now more or less obsolete; yet the germ of truth in them was sufficient to warrant the retention of the nomenclature, which affords convenient signs to indicate certain conditions of the organization. They have been classified by some writers under the following headings, namely, the sanguine, the bilious, the melancholic, the lymphatic, and the nervous.

In the sanguine temperament, you may expect a ruddy, healthy complexion, full contour of neck, and predisposition to determination of blood to the head; the development is usually muscular, the extremities warm, and the mind free from hypochondria. In such an organism, the teeth are generally of a yellowish tint near the gum, gradually fading to a lighter hue at their cutting edges.

The bilious temperament displays a sallow complexion, the circulation of the blood being slower, while the body presents an angular appearance. Those possessing it sometimes fulfil the idea of having "an iron will," but instances of resolution are not unknown to other temperaments, being developed by favouring circumstances, until the original character is overshadowed by the new.

Another temperament embraces a class designated the melancholic. In physique thin and spare, with narrow, deep chest, the distinguishing feature is the prominent and fully developed frontal bone; a severe and usually stereotyped expression being depicted upon the countenance. In this temperament, the powers of thought are ordinarily deep and strong.

The lymphatic temperament imparts a hyper-sensitiveness to the teeth, and, although these organs may appear good, they will, in many cases, be found defective. Chronic diseases are more often developed in this temperament than in any of the others.

The nervous temperament is characterised by greater activity of body, and is more susceptible to impression. The mind being easily excited, great despondency and nervous fear are occasioned by incidents of a very trifling nature. Here you may look for the contracted maxillæ, in which the teeth are crowded from the moment of their eruption.

The characteristics of temperament, so indicative of the predisposition of the teeth, point to the necessity for systemic treatment in many cases, to avert local consequences.

The teeth may be classified as, first, those usually found associated with the sanguine temperament. The prominent points, although displaying well the presumed cuspid development, are not separated by abnormal sulci, and the organic basis substance is united with the earthy matter by a perfect calcification.

Sometimes, from congenital peculiarities, large teeth are developed in jaws of limited dimensions, resulting in marked disfigurement, a condition that requires careful judgment as to the time when treatment should be given, and the means to be employed. Constant but gentle pressure will generally force the teeth into their normal positions, thus causing expansion of the maxilla adequate to the requirements of any ordinary case. Should, however, the derangement be so excessive as to preclude this measure, the removal of a tooth on each side will permit of ample space in which to force the remaining teeth into their true curve; the tooth to be selected is usually the first molar, for reasons already enumerated. Such a course will often result in greater benefit than if the teeth were permitted to remain. With the recognised mechanical appliances at your disposal, the voids, if not entirely closed, can be reduced to a minimum, and rendered imperceptible to the ordinary observer. Crowded teeth in the mouths of adults are not so amenable to treatment, and are the cause of much serious mischief from mechanical and chemical action. Constant watchfulness will be required to prevent lesions of an aggravated form, owing to the difficulty of a sanitary condition of the mouth being observed; for, while teeth so abnormally situated have the appearance of being sound, disease often makes serious inroads upon them without cognizance being taken of it. By the irregularity of the teeth, pockets are formed in which, not only food, but vitiated secretions are permitted to lodge, and by chemical action these form acids, destructive to the enamel. Tests should by applied to the fluids pouring from the glands and mucous surface into the mouth, to ascertain whether their condition contributes another destructive agent to decomposition of substances remaining between the teeth. With the particles of food so detained, an alkaline state of the oral secretions may be no security for the preservation of the teeth, save in the exposed parts which we know in caries are often mysteriously preserved; but, on the contrary, by combining with some of the products of decomposition, may release other agents injurious to the teeth. Another ill effect of crowding is friction, developed on the proximate surfaces during mastication. The formation of the alveolar process, and the intervening periosteum, together with the general disposition of the muscles of the face, favour a limited mobility of the teeth. Therefore, when the moderately hard alimentary substances are comminuted, the distribution of pressure over the general surface of the teeth is unequal. Those occluding will sink slightly in their elastic setting to a distance inappreciable to any ordinary measurement, but sufficient to eventually remove by friction the enamel on the proximate surfaces, unless the teeth are independent of each other. This aids the destructive inroads of the various other causes of offence, and hence the numerous cases of decay on the proximate surfaces which are only revealed in their first and second stages by the use of the finest exploring instrument.

The second class of teeth are associated with the lymphatic temperament, and partake of the general attributes of the physical being of the individual. The laxness of the tissues and the tendency to serous effusions have their counterparts in the excess of gelatinous constituents in the teeth. The tendency to disintegration is associated with exquisite sensitiveness, combined with a leathery toughness indicative of their structural peculiarities.* Here the exhibition of any hardening agent is strongly indicated; and if a sufficient, but not excessive, reaction can be produced, it is not unreasonable to suppose that there will be deposited a semi-transparent dense stratum, thus bringing about a change in the tooth that will admit of the use of gold as a filling material. The oxy-chloride of zinc may be employed as an excitant for promoting the condition just named; tin, however, can hardly be considered second to it as a material for preparatory purposes. After a period of several months, the test filling can be removed and a note made of progress in Nature's defensive efforts. The formation of the hardened stratum extending cone-like towards the pulp may be prolonged for an uncertain time. On the removal of the filling, should it be found that this tooth density has not been attained, it will be necessary to refill the cavity with a similar material, as the only means by which to preserve the organ. Caries in this temperament would run a swift and destructive course if neglected, owing, perhaps, to struma or hereditary tendency to disease. In youth, the use of means adapted to preserve the general health, combined with frequent examinations, will be necessary.

In the third class there is no marked absence of calcigerous deposit. While there may be a superabundance of it, it appears to be in an amorphus rather than a globular condition; indicating that the forces which govern the disposition of the lime salts have been deficient during the development of the organs. The spiculæ into which the anastomoses and ramifications of the canaliculi divide the intertubular deposits figurately resemble carbonate of lime, as illustrated in chalk, rather than the crystalline state of marble, or the fluor spar (fluoride of calcium) which takes so beautiful a polish. These teeth are a most fertile field for dental labour, and are found in all temperaments, but predominate in those of a strumous diathesis. The employment of gold will not always be satisfactory when used even upon adults; so that, in childhood, improvement should be aimed at by a dietetic regimen calculated to stimulate an active deposition of lime salts in the osseous tissues, previous to the use of any permanent filling material. Liquor calcis, the coarser cereals, and general bone-producing elements should be the main staple of food; while the improved tone of the system may favour protoplasmic formations that constitute a part of the normal and healthy tooth.

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* These teeth are such as not to permit the employment of gold with permanently beneficial results without a preparatory course of treatment, in order to close the foramena of the tubules in proximity to the cavity.

We will now review the last class—namely, teeth of symmetrical shape and pearl-like tint. These are found in delicate physical organizations, and usually belong to the nervour temperament, sometimes to the encephalic. The dental organs correspond with the general development of the system of the individual, being small and well-formed. They show no special tendency to caries; but, should the incisors be attacked, great disfigurement ensues, as the transparent enamel reveals an intensely blue-black spot, which can be seen from a considerable distance. The remarks made on the other teeth apply to these, but the limited original vital impulse is such that treatment should, if possible, be accompanied by strict attention to the general health in youth. In regard to this I may remark that the development of tuberculous diseases, contrary to what might be expected, does not appear to influence the number of cases of caries—consumptive persons often going to the grave with dentitions perfect to outward appearance; but the deficiencies common to the tuberculous (from that low vitality which permits degenerate substances to be formed within the system) may exist, and distinctive evidences of disease would, I doubt not, be found stamped on the teeth, could a sufficient number of them be examined with microscopic accuracy.

Having briefly noticed the classes of teeth, I shall now pass to the consideration of (1) disease of the teeth, and the deficiencies which may be suspected in their development; (2) the lesions to which they are subject from external influences; and, lastly, Therapeutics as applied to these two sections. Treatment will embrace the hard and soft tissues of the oral cavity, and extend into the facial region, incorporating the diseases of the antrum, the actual contact of which sinus with the apices of the roots of the anterior molars, brings some of its affections strictly within the denomination of dental lesions.

Important and sometimes misunderstood pathognomonic symptoms may be developed in infantile diseases resulting from dentition. There are instances, however, where the eruption of the teeth proceeds with remarkable freedom from pain; but more generally it is accompanied with a variety of lesions, and the Dentist, in common with the physician, may be called upon to decide to what extent the disorders of the infant are attributable to the teeth. In recognition of the intimately connected relationship of the teeth with systemic disorders will be found a justification of the extensive curriculum now demanded of the dental student. It is unquestionably a fact, quite overlooked in many instances, that reflex action primarily induced by erupting teeth is "but the spark to the flame which burns only on some previously existing morbid material." Hence the pathology of such existing disturbance should be thoroughly understood. Dentition in the infant may induce any of the following—*i.e.*, epilepsy, opthalmia, otitis, cutaneous diseases, diarrhœa and other morbid reflex actions. At the period of eruption, the gums become tumid, the saliva increased, and the child restless. In aggravated cases, the general economy is involved, various symptoms indicating the disturbance, as diarrhœa and pyrexia, which are commonly associated with early dentition.

Although treatment of infantile diseases arising from the teeth might be considered the special prerogative of the Dentist, it is the custom to place these cases in the hands of the physician, and, not until systemic derangement resulting from these organs has been superseded by that of a local character, is the attention of the Dentist ever called into requisition.

With the busy medical practitioner whose mind is preoccupied with more *apparent* causes of suffering, disorders originating in the teeth are too frequently overlooked, even when reflecting cerebral disturbance, as well as the influence they may exercise upon organs of a less vital character. The complicity existing between these several sections of the economy is clearly proven by the aberration in perception of pain so frequently to be contended with in daily practice; and, to show that the importance of this question is becoming more appreciated by medical men, I quote from an author writing upon the sympathy existing between aural and dental lesions, who "was so much impressed with the frequent co-existence of" those "diseases in many of the patients who came to him with the former affection, that he resolved to assume the task of recording the results of any subsequent observations on the subject."

He remarks, "The pain of the teeth, which we familiarly associate with their inflammatory condition, is signally absent in many of their affections, and it is to the absence of this symptom that the chief danger is attributable. Clinical experience has furnished me with numerous examples illustrative of this fact, where most extensive and destructive disease of the teeth, gums, etc., were wholly unrecognised by the patient until his attention was drawn to them as the cause of tinnitus aurium and deafness."

* * * * "reviewing the records, which I have since kept of some 1,500 cases, I find that the teeth are more frequently the seat of disease than I at first suspected, for, of these 1,500 aural cases, perhaps one-third owed their origin, or continuance, in a greater or less degree, to diseases of the teeth."

* * * * "opportunity was afforded me to examine the aural cases in a large charitable institution containing children of both sexes, who were almost exclusively within the period embraced by the

second dentition. About 6 per cent. of the inmates were found to have otitis media purulenta, or were the subjects of ear-ache."

I have already described the difficulties experienced in dealing with children, from their incomplete mental and physical development. In the active change, which is constantly taking place in the nerve centres, and their consequent great susceptibility to morbid influences, will be found a probable explanation of the predominance of disease in the teeth, characterised at this period by reflex action. Where pain is experienced, equal parts of chloroform and tincture of aconite may be administered to the affected pulp on a cotton pellet, taking care, however, that the cotton is not pressed on the pulp, so as to be itself a mechanical means of offence. The relief so afforded being but temporary, it generally becomes necessary to destroy the nerve. Cobalt may be employed for this purpose in the deciduous teeth, or a milder preparation may be used in the form of a fully saturated tincture of iodine. Fortunately for children, the memory of pain is but transient; and with the shedding of the deciduous teeth, the ills peculiar to those organs cease.

I have hitherto omitted one systemic cause for odontalgia—the sympathetic action and wasting effect on the dental organs by pregnancy. The extreme tendency of child-bearing women to lose their teeth is a well-established fact; and with this, as in many other truths, popular instinct has preceded scientific investigation. If there be a withdrawal of nutriment, it is a strong argument favouring the existence of a circulating medium throughout the dental tissues, which is acted upon by certain abstractions from the system; the condition of the economy from gestatory influences so vitiating the fluids of the oral cavity that the teeth by this means are destroyed.

Pain arising in one tooth may affect several teeth in the same jaw. This is an example of "diffused" nervous action, the impressions being conveyed to the branch of the trigeminus in much the same way as the mind refers the position of a distant object to the final direction in which a refracted ray reaches the optic nerve through the eye. Where a test is required, each tooth should be gently tapped, and, by the alternate application of hot and cold water, difference in sensation is observed. Those teeth in which pain is most evinced should be examined with the mirror, opacity to sunlight indicating death of the pulp.

Sensation is produced in parts quite remote from the foci of disease, extending the disease to the trifacial tract, the scalp, and even to the shoulder, while exceptional instances are recorded of suffering in parts of the body still more remote. These are examples of "associated" and "reflex" nervous action.

The excitant to odontalgia is usually exposure of the pulp, by attenuation of the hard tissues surrounding the pulp chamber; so that the primary examination will be for caries. If pain is produced by exposure, ascertain the condition of the pulp—whether devitalized or only partially so. If it has been the cause of much or repeated suffering, the indication would be to remove it, as its loss may be predicted, in which case the trouble will not be confined to the pulp only. Should however there be no appearance of decay, shock of some kind may be suspected, leading to inflammation of the pulp which, unless properly treated, will extend to the pericementum.

The next stage is the development of parulis, alveolar abscess, or gum boil. The inflammation of the peridental membrane causes a thickening of that part situated at or near the apex of the root. The lymph exuding from the membrane forms a sac or cyst within which pus accumulates. Should extraction from any reason take place at this period, the cyst not unfrequently accompanies the diseased root, presenting a filamentous appearance, bunched at the apex of the root, like that represented in fig. 35.

The accumulation of pus in the alveolar socket is accompanied with pain sometimes the most intense, which may be compared with that experienced when pus is formed in other and inelastic saccular regions of the frame. By pressure on and absorption of the alveolar process, a fistula may be produced following the line of least resistance. With the escape of pus, the acute pain ceases. Should the fistula reach the cheek, a permanent disfigurement may be caused; therefore fomentations and treatment must be directed with a view to the evacuation of pus into the oral cavity, where, in ordinary healthy diathesis, its presence is more disagreeable than dangerous.

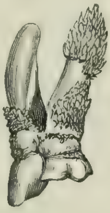

FIG. 35.

The treatment must be in the use of escharotics thrown into the sac to break up and destroy this pseudo membrane, so as to allow protoplasmic reunion of the tissues at the apex of the root. When there is an open fistula, the abscess syringe may be employed to force the remedy to its objective point; or, perhaps, a better method is to pump the remedy through the root canal and alveolar opening with a nerve broach, filaments of cotton being wound upon the barked end. Creasote, carbolic acid, or iodine, or a combination of these substances, by these means, can be forced through the pulp canals, until, by making their appearance at the fistulous opening, evidence is given of the thoroughness of their application. When the pus has failed to burrow a channel to the external surface, it is not so certain that the disinfectants will penetrate the sac, in which case you may dissect back the gum, and treat as just described; but, should there be a continued discharge of morbid matter, you are justified in cutting off the end of the root—through the alveolus—and removing it, together with its morbid cystic attachments. Some care will be required in this, for the following reasons: 1st, you may not hit the apex of the root, which by no means is to be found exactly in the same place in all individuals; and 2nd, although the causes may be nearly identical, they are not always followed by the formation of a sac from circumscribed suppuration. The pus formed may occur in patches on the root of the tooth, or by diffusing itself over the periosteal membrane, produce, first, elongation, and, finally, ejectment of the tooth from its socket. You will be to some extent guided as to the difference, by observing whether a well-marked determination to some extraneous point is evidenced, or whether the pain is more generalized, and accompanied with indications of pus at gingival border.

Ordinarily, slight cases of periodontitis disappear when the source of irritation is removed. But acute periodontitis—unless aborted by antiphlogistic measures, as the use of pediluvia, sedatives and leeches—runs its course, and terminates in a cystic formation upon the fangs.

Pericementitis may, from neglect, assume a threatening condition. Especially is this the case in the dentes sapientiæ; the remote positions of these teeth prevent the inspection which can be made of the other teeth, and the pain is referred to other regions—the ear sometimes being implicated. The inferior dental nerve, accompanied by the dental artery, enters the canal at the ramus of the maxilla in a space so confined as to bring it very near the root of the wisdom tooth; and, by pressure on the nerve from cystic formations on the root, causes neuralgia.

Erethism of the masticatory branch of the fifth nerve supervening trismus of a tedious and perhaps dangerous character might ensue. Should this occur, the jaws require to be separated by gradual but persistent force. When the mouth, by this means, is sufficiently opened, the dentes sapientiæ, or teeth causing trouble, can be treated according to the condition in which they are found. The rigidity of the maxillæ may not be removed at once, but require prolonged treatment, with the use of special contrivances to stretch the muscles. Other causes of closure of the jaws besides periodontitis and alveolar abscess exist;—but they belong rather to the sphere of surgery at large than to the subject to which I have confined my remarks.

BOOK REVIEW.

A MANUAL OF DENTAL ANATOMY. By CHARLES S. TOMES, M.A., F.R.S., &c. Second Edition. London: J. & A. Churchill.

IT had been rumoured for some time past that a revision of Mr. Tomes's "Dental Anatomy" was in course of preparation, and we now hail its advent with pleasure. Of the character of the book we need say little, as it is already so well known. It is an invaluable work, clear, readable, and scientific; and we are proud that there exists in our Profession a member who has the knowledge and ability to write such a concise, at the same time comprehensive, treatise on matters that so closely concern us.

The nature of certain of the changes in the new edition we anticipated with some amount of certainty, notably in the accounts of the different kinds of Dentine, and, also, some allusions to the somewhat recent investigations of Magitôt and Bödecker. In the latter part of the book some interesting details have been added to the text which help to make the more technical reading lighter, and at the same time impress the facts more readily and firmly upon the student's mind. The different subjects have been better grouped in this than in the former edition, and each subject is headed by its title in large clear type, thus obviating the difficulty in reference which many found to be a disadvantage previously. We notice that paragraphs, the bearings of which the author considers to have become obsolete, have been omitted altogether, or rewritten; and it is with great interest that we turn to see what influence recent discoveries and theories have had upon our author's mind, and also to learn his opinions of them. Many points that were wanting in clearness have become elucidated; but there are one or two clerical errors and somewhat loose expressions which we are surprised to see repeated in this edition. As an example of the former it will be noted that the word "lingual" is used instead of labial in the sentence "its outer or lingual border" in the description of the upper premolars, on page 14. The book itself is but little altered in bulk; yet there are some 34 additional pages, and 12 new illustrations, and the type, too, is larger and clearer. Mr. Tomes throughout treats the opinions of others with great fairness and liberality; if opposed to his own views he states first the reasons which seem to him to prove his own correct, and then gives the opinions of other authorities, with his objections to them. Most of the original fresh material seems to be embodied in the chapters on the Dental Tissues and the Attachment of Teeth. In the additional matter that has been compiled from recent works Mr. Tomes has been careful in each case to acknowledge the author.

In the first chapter the relation of teeth as dermal appendages, and the nature of their connection with bone, are very plainly set forth. The placoid scale has lately been demonstrated to consist not only of dentine but to have, besides, a covering of enamel; and thus, in the young shark, not only are the teeth within the mouth and the spines outside of it, continuous and homologous, but the microscopical structure of the two are identical. In speaking of their relation to bone as being merely a secondary matter, the author quotes from a work by Dr. Harrison Allen, who says: "If the hairs of the scalp were to be inserted into the skull, or of the moustache into the upper jaw, we should express great astonishment, yet such an extreme proposition is no more remarkable than what is seen to take place in the jaws."

We might notice in passing that we fail to see why the upper third molar is still described with the lower molars, instead of the description of that tooth being inserted along with the obervations upon the other upper molars.

We should have expected to have seen the peculiar construction of the crowns of the Upper Bicuspids noticed, by which the teeth of different sides of the mouth may be readily discriminated; the difference has appeared in German works on the subject, and it is a point that was well known in the old days of bone-carving. We should also wish to notice the last paragraph of this chapter, which says that the "second lower deciduous molar has four cusps and resembles a second lower permanent molar"; but surely the second lower temporary molar has five cusps, in which case it would resemble the first lower permanent molar.

Passing on to the second chapter, the Maxillary Bones are described; more particularly in their general characters. There are not many alterations here, except the omission of some anatomical details which, as Mr. Tomes observes, "may be found in any general anatomical work," and the insertion of some interesting remarks relating to the maxillæ and the admirable way in which they are constructed, so that the force of blows received upon the prominent parts is distributed to the stouter walls of the cranium. There is one point, however, to which exception may be taken. The external Pterygoid, besides being described as a muscle for drawing the lower jaw forward upon the upper, is spoken of as one of those through which "the closure of the jaw is effected," and, as it draws the lower jaw forward it also "in some measure tends to open it." All these three actions are not generally placed to the credit of the External Pterygoid.

The chapter on Dental Tissues has, as Mr. Tomes says in his preface, been in a great part rewritten; and we cannot but congratulate the author on the results of his labours in this direction. The confusion arising from the alteration in nomenclature since the publication of the first edition has been quite cleared up, and the matter is now set before the student in such a way as to enable him to grasp the subject at once, and with comparative ease. When speaking of the arrangement of the Enamel Prisms the author has somewhat modified his views with regard to the existence of an intercementing substance. He says: "The prisms are solid and apparently in absolute contact with one another, without visible intervening substance. But Bödecker, basing his conclusions upon the examination of very thin sections stained with chloride of gold, holds that there is an intercementing substance, from which fine processes are given off, apparently piercing the prisms, and that there thus exists a fine network throughout the substance of the enamel. This he does not regard as a mere cementing material, but as an active protoplasmic network connected with the soft contents of the dentinal tubes, in this way rendering the enamel more alive than it has hitherto been supposed to be."

Mr. Tomes considers that, although there are various reasons for suspecting that the enamel is not completely out of the pale of nutrition from the moment that the tooth is cut, "it is improbable that nucleated protoplasmic masses are contained in the interstitial substance of the enamel, as maintained quite recently by Bödecker."

Mr. Tomes gives a very fair criticism upon this discovery, and the *primâ facie* evidence is certainly against the theory of the nutritive function ascribed to the cement substance by Bödecker, but we can well imagine how that observer, justly proud of his achievement, would be led to attach greater importance to its presence than was really due to it.

Recent views as to the nature of the dentinal fibril seem to differ only in part from those now very generally accepted, with one exception. Klein believes that the fibril is a prolongation of a layer of cells lying below the odontoblasts, which latter are concerned solely in the elaboration of the matrix. Magitôt also agrees with Mr. Tomes only in part, but the summary of the differences seem to show that he (Magitôt) denies the existence of the sheaths of Neumann. The same author appears again in connection with this subject, and, if his views are substantiated, they will elucidate the difficulty of accounting for the sensitiveness of dentine. He describes and figures a layer of reticulate cells lying immediately beneath the odontoblast layer. These reticulate cells are continuous on the one hand with the nerves of the pulp, which lie in a plexus beneath them, and, on the other hand, communicate freely with the processes of the odontoblasts. One of M. Magitôt's figures is introduced here which, if correct, certainly seems very conclusive; but, as Mr. Tomes observes, the accuracy of his views require to be confirmed by other investigators before they can be generally accepted.

According to Bödecker, however, the fibril is not the only soft matter contained within the substance of the dentine. By the use of chloride of gold as a staining agent, the fibrils are seen to give off tiny lateral processes which appear to pass into the dentine, while the matrix presents the appearance of a faint network; from this Bödecker infers that it is penetrated everywhere by a network of living plasms, derived from, though far finer than, the dentinal fibrils. Just in the same way, this writer, when speaking of the cementum, describes a much finer set of offshoots from the lacunæ than the ordinarily visible canaliculi, which he believes to permeate the whole substance of the cement matrix. Mr. Tomes speaks of these statements in the following manner:—"The human tooth is, accepting as correct the researches of Bödecker, which appear in every way deserving of credence, connected with the living organism very intimately even though its special tissues are extra-vascular. For blood vessels and nerves enter the tooth pulp in abundance, the dentine is organically connected with the pulp by the dentinal fibrils, these are connected with the soft cement corpuscles, which again are brought by their processes into intimate relation with similar bodies in the highly vascular periosteum. So that between the pulp inside and the periosteum outside there is a continuous chain of living plasm."

Passing on to the other varieties of dentine, we find them arranged in two groups. The first including those forms developed from a distinct odontoblast layer, namely, ordinary dentine, plici- and vaso-dentine; the second consisting of osteo-dentine only, which, in its nature of development, very closely resembles bone. Vaso-dentine is very common in the teeth of many fish, as the hake and cod tribe, and resembles hard dentine very closely in its structure, except that there are vascular canals ramifying through its substance; and that in a typical specimen calcification has gone on to the entire obliteration of fibril and sheath, leaving only one homogeneous matrix. These canals are sometimes so abundant as to give the tooth in a living fish a brilliantly red appearance.

The tooth of the pike is taken as an example of osteo-dentine, and is figured very faithfully. After the pulp has deposited an external covering of tissue almost like ordinary dentine, it changes its action, and a coarsely channelled tissue is formed "containing elongated spaces filled with pulp, from which canaliculi, like those of bone lacunæ, branch off in all directions but do not run far." It is not a little curious that in the formation of these varieties of dentine the same pulp is able to develop on the one hand both hard- and vaso-dentine, and, on the other, both hard- and osteo-dentine. As Mr.

Tomes observes, it makes it easy to understand how that the so called secondary dentine, produced in a pulp which ordinarily forms the hard unvascular tissue, may partake of the character of either of the other two varieties.

In the chapter on the Development of the Teeth a special cement organ is mentioned and described. According to MM. Legros, Robin, and Magitôt, cement is developed by the two methods similarly to bone. On the roots of teeth where only a thin layer is required ossification takes place in membrane, by the calcification of osteoblasts supplied by the tooth sac; but in positions such as on the crowns of the teeth of the ruminants, where cement is found in quantity, it is developed by a process similar to the calcification of bone in cartilage. This special organ does not take on its characteristic structure till after the completion of the enamel and dentine. M. Magitôt describes it as consisting of a fibro-cartilaginous matrix, with characteristic cells embedded in its substance, containing one, two, or rarely three cells, which have spherical or ovoid nuclei. This text is illustrated by a figure showing the cartilage cells and capsules embedded in the matrix which render the description very clear.

In the article on Calcification we are rather surprised to see that the word "lime" so constantly recurs, instead of the more correct term calcium (we refer more especially to the use of the word on page 150). In another part of the book, on page 50, the alteration has been made, but by some mischance, we presume, it remains uncorrected here. The term, though, perhaps, its meaning be clear, might possibly mislead, and is scarcely in accordance with the high scientific character of the book.

The calcification of vaso-dentine is similar to that of hard dentine, except that the vessels do not recede with the pulp before the advancing line of calcification, but remain and become embedded in the hard tissue: "So that if we imagine a vascular papilla to have its stroma suddenly petrified, while its circulation went on all the same, we should have something like a vaso-dentine." Osteo-dentine is calcified by a process exactly like that of any membrane in bone.

(*To be concluded.*)

THE STRUCTURE OF THE TEETH OF THE PIKE.

By Dr. Alfred Sternfeld.

Abstracted and translated from *Archiv für Mikrosk Anatomie*, Bd. 20.

Dentine which contains vessels was certainly well known to Retzius; this is clearly proved by his statements on the teeth of the *Esox Lucius* (the fresh-water pike) and the *Gadus Molva* (the cod).

Referring to the first, Retzius says that the large tubes in the interior of the tooth-carrying bones contain, every here and there, a blood-like substance, and therefore can, in a great measure, be looked upon as pulp cavities. He compares the arrangement of these tubes in the Ling, with the finer blood-vessels in the intestinal villi, which would imply that Retzius knew the true nature of Dentine.

Prof. Owen, out of the many names given to tooth substance, introduced the general use of the term "Dentine;" and he particularly distinguishes vessel-holding Dentine, giving to the subdivisions and modifications of the latter, different names. The term "Vaso-dentine" I shall generally apply to all vessel-holding Dentine; and when Dentine neither holds vessels, nor has Haversian canals, but has lacunæ containing bone-corpuscles, and by this resembles bone-tissue, it will be termed "Osteo-dentine." The best proof of this is that, because of the gradual transition of one tissue into the other, neither term is in many cases justifiable. Owen, in his "Odontography," constantly speaks of "Vascular dentine" as comprising Vaso-dentine and Osteo-dentine. In modern times, Charles Tomes has again written upon the different modifications of Dentine, and has come to the conclusion that, in all, there must be four distinct varieties of Dentine. By this definition of the term he verified the chief explanation given by me; by taking notice of these I make out the following to be Tomes's definitions of Vaso-dentine:—

VASO-DENTINE is a tissue without genuine dentinal tubes, although in the odontoblastic stratum it is wholly constructed of a simple pulp. The Dentine is abundantly pierced by tubes of large calibre, which are formed at the time of calcification by the enclosure of capillary vessels of the pulp, and the tubes contain such capillary vessels. An example of that structure is found in *Merlucius Vulgaris* (the hake). The absence of dentinal tubes in Vaso-dentine is not particularly noticed by Tomes. He also omits mentioning them when they do exist.

OSTEO-DENTINE, for which the pike's tooth is given as an example, is without dentinal tubes, and has an outward layer of hard Dentine on its surface. Calcifying processes shoot through the whole substance of the fully developed pulp, so that the Osteo-dentine does not proceed from any special odontoblastic layer. The large tubes contain no capillaries, and the only difference between this tissue and the bone, lies in the fact that it is developed in tooth-pulp. The tooth of a pike is in such close relation, or so interlaced with the bone, that it can suitably be described as a conical bone nucleus which is furnished with a thin membrane of hard Dentine. According to Tomes, the Osteo-dentine originates in the band-shaped calcification of the pulp, and the enamelling of this osseous band, which, as a matter of accident, may contain vessels; but these, however, do not fill the entire space.

The principle difference between Vaso-dentine and Osteo-dentine is, according to Tomes, that in Vaso-dentine an odontoblastic calcification takes place in eccentric layers; whereas in Osteo-dentine the pulp tissue calcifies irregularly and canalicular lacunæ are formed, and, in the substance of the uncalcified pulp-tissue, vessels can occasionally be found. The Vaso-dentine, therefore, possesses much less pulp, with a smooth surface; whilst Osteo-dentine, when any remaining pulp exists, possesses a completely uneven surface, and the calcification is quite irregular, and has never been in the form of layers.

I shall now describe VASO-DENTINE according to my own preparations. It is easiest seen on the dry sharp edge of the pike's tooth which, without any further treatment than an imbedding of Canada Balsam, presents the structure of its substance to this test, but not so with the root portion. The teeth are decalcified by the use of a half per cent. of chromic acid with a half per cent. of hydrochloric acid, washed in distilled water to remove the acid, and then hardened in alcohol. The sections of decalcified teeth are tinted with carmine, hæmatoxylin, or Bismarck-brown. A solution of acetic acid, of varying strength, is applied to the carmine colouring; the sections remain in it from 12 to 24 hours, are then rinsed with water, and by the glycerine of muriatic acid (glycerine and distilled water equal parts + ½ per cent. hydrochloric acid) distinct nuclear variations are brought out. The sections remain in this from 5 to 15 minutes, and then are passed through a weak solution of hydrochloric acid, and are brought to a red-like colour with ammonia (of the same strength as the hydrochloric acid). Bismarck-brown, in a watery solution of varying strengths, is used next, the sections being allowed to remain in it for about five minutes, and then put into alcohol 90 per cent. In some cases the after-tinting is accomplished in a weak solution of picric acid, and then in absolute alcohol, in which picric acid is known to be barely soluble. The sections thus tinted, now show greater complication in the construction of their ground substance, than can be supposed to exist in the uncalcified sharp edge of the tooth.

The course and communications of the canals can only with certainty be followed in preparations in which the whole canal system is filled with a pigment. It is seen that the longitudinal course of the canals preponderates, and that these are bound together by numerous transverse oblique anastomoses. The calibre of these canals is very variable, alternating between 20 and 70 u.

The substance of the axis of the crown of the pike's tooth is not only traversed by these coarse canals, but also between these a finer system of tubes is very often found, which I shall designate as the primitive tubes of the Vaso-dentine. These primitive tubes are absent in the root portion, and this is also the case with the border between the root-piece and the crown of the tooth. This system of primitive tubes is not made perceptible by Tomes, who says that the centre of the tooth and the underlying bone are so similarly constructed, that it is absolutely impossible to find between them a line of demarcation in a fully-developed tooth ; and thereby his dispositions of the different modifications of the Dentine lose their importance.

Primitive canaliculi have the following characteristics on the well-injected edges. From the afore-mentioned large canals finer branches are given off for short distances, which ramify and enter into communication with neighbouring branches, and thus give rise to a network of roundish quadrangular couplings; these couplings are distributed equally through the entire extent of the calcified ground substance, so that the larger canals, by this system of primitive canaliculi, are bound together. The calibre of these primitive canaliculi is the same as that of the proper Dentinal tubes, and there can be no doubt that both systems have an analogous formation. We have also in the substance of the axis of the crown of the tooth the Vaso-dentine, a tissue which holds the medium between the connective bone tissue of the Root-piece and true Dentine. After I perceived that the tubes of the Dentine in the substance of the axis of the crown of the tooth were analogous to the primitive tubes, the term "Vaso-dentine" seemed to me to be particularly appropriate for this tissue ; and, therefore, I maintain the same in opposition to Tomes.

Among the contents of the larger canals are one or two vessels, which partly show the structure of capillaries, and partly show thicker walls, provided with longitudinally arranged muscle-nuclei. In many vessels an outer endothelial layer with nuclei jutting-out into the cavity of the canals can be perceived, so that the perivascular space also possesses an outer endothelial covering to the canal wall, and an inner one to the surface of the vessels. Enclosed spaces are therefore found in the canals of the vessels, which may, with all probability, be described as lymph spaces, as they already have been in the root-piece. The walls of the vessels stand off most plainly from the endothelial (surface of the) tube of the canals, and they are abundant in spindle-shaped or stellated cells which have their origin between the surface of the vessels and the endothelial (surface of the) tube, and are fixed to the canal wall or suspended in the cavity of the canal. It follows, therefore, from this, that Tomes's statements on the tissue of the axis of the Pike's teeth are to be corrected. They are not found, as he asserts, only sparingly and in exceptional ways in the vascular canals, but without exception. The larger canal system carries blood vessels in its entire extension, but certainly not these only. Of what especial interest would it now be to settle decidedly what the contents are that are found in the primitive tubes of the Vaso-dentine, if they are the same as the tubes of the true Dentine, containing soft fibres, and, when it is so, from what elements these fibres proceed? I shall answer this question after describing the relation of the Vaso-dentine to the covering of true Dentine.

(*To be concluded.*)

GOLD RESTORATION OF ABRADED DENTURES.

Abstract of an article communicated to the *Southern Dental Journal.*

By E. Parmley Brown, D.D.S., Flushing, N. Y.

Mechanical abrasion, assisted by chemical erosion of the human teeth, is fast drawing its victims to a condition of helplessness, so far as ability to properly perform the important operation of masticating the food is concerned. We hear, and perhaps know, of cases where a ripe old age is attained, where edentulousness has existed for a score or two of years; but investigation would surely prove that these cases are exceptions to the rule of "loss of teeth, loss of life," unless artificial dentures replace the loss, and then a large percentage of substitutes for the natural organs, only partially supply the organs of nature.

"Diamond cut diamond" is the general principle that underlies the mechanical abrasion, and when spots of dentine are exposed, the surface is softened or decalcified if acids are sufficiently present in the mouth, either in the secretions, the gums, or taken in the food or drink—then the mastication removes the softened surface, only awaiting another chemical assistance to repeat the operation of destruction that is slowly but surely dragging the victim to an untimely grave; for this manner of losing the teeth is less apt to be remedied by the substitution of artificial ones before it is too late, as the process is so much more gradual and less painful, than when the teeth are seriously attacked by caries, and neglected to the critical point of being lost. The victim year after year calls forth less saliva to mix with the food (which prepares it for better digestion), grinds the food less perfectly, until the teeth worn down to the points of gum, make the operation of chewing so painful that it is in extreme cases not done at all, taking into consideration the pain produced by the ends of the canaliculi being kept open by the wear, thereby in some cases adding the pain resulting from mastication and also the pain produced by acids.

The vital statistics of a savage island in the Pacific, tell us that old age there is forty-five years, and that the natives actually die gradually of starvation, by feeding on roots to a great extent, and wearing the teeth entirely away. And in about the same condition is the Esquimaux, who tans his dog-harness and moose-hide strips for his harpoons, by chewing them for weeks.

The habit of grinding the teeth together during the hours of sleep, or while awake, is I think the only other extensive cause of the subject of the Paper. The loss by decay and extraction of many of the back teeth, accelerates the process of wearing away; but the remedy is now at hand, and the sooner taken the better.

Until cohesive gold became properly handled, no remedy was known for this unfortunate condition of the teeth of mankind. Taking into consideration the fact that the operation of extracting a mouthful of such firmly set roots, was one to be dreaded, and generally put off from year to year, until the health of the patient was so impaired as to make life miserable, if not materially shortening it.

There are but three distinct ways of producing the desired effect, and these used separately or in combination, in case of living pulp. First, screws inserted in tooth at safe distance from enamel and pulp; second, a groove cut around the pulp, as much inside the enamel as best suited to the case; third, a number of retaining pits drilled just inside of enamel, and safely away from pulp, with some concavity in centre of crown if possible, and a bevelling of enamel margins from twenty to thirty degrees; pits from four to ten in number, as may be required, with counter-sinking and enlarging their bases, to strengthen and retain the gold—pits as large as possible without encroaching too near enamel and pulp, and deep enough according to size of pit to retain gold properly. In these pits small pieces of gold should be very thoroughly impacted with a decided force and small-pointed plugger. This preparation of crowns I prefer to the groove system, as a blue line may appear in many cases around the gold from the continuous gold reflecting through, and the force used in filling the groove with gold may crack or slab off the enamel in delicate teeth; the pit system requiring less time to prepare, and giving less pain to the patient, as less tooth material is removed. A system of pits and screws combined would be preferable to the groove plan, but the pits alone, in most cases, will answer if the Dentist is not supplied with screws, and is skilful in their use.

Pulpless teeth, especially in cases of lower incisors, may require gold-wire pins, trimmed to the form of the channels, almost to the apex, and barbed for retention when driven home, extending above the abraded surface, to retain filling and strengthening cap. Some diamond-pointed teeth that have been so well formed and densely constructed as to wear their antagonists without being worn, can, in most cases, remain uncapped, the restoration being all done on the abraded teeth occluding with them.

After examining many museums in Europe and America with reference to this subject, I come to the following conclusions, and cite a few cases. In carefully studying the classified crania in the catacombs of Paris, where eight million human skeletons are stored, where for half a mile the skulls are walled up on either side about eight feet high, held in position by the long bones piled like kindling wood, I find that abrasion of the teeth has been about as common with the Parisians, for a thousand years past, as it is to-day with them and other civilized people; but caries of the teeth not near so prevalent as now, it being difficult to find among many hundreds of skulls a maxilla where the teeth were gone at the time of death. The limestone formation on which Paris is built prevents the disintegration of osseous remains buried there, and as the city encroached on the ancient cemeteries, the abandoned stone quarries, fifty or a hundred feet below the surface, have been utilized as store-houses for this valuable collection.

Also the examination of about three thousand crania from every part of the globe, in the Hunterian Museum of London, shows, apparently, that abrasion of the teeth is a world-wide complaint, and the percentage about the same in the past as at present; accounted for by nervous diseases of civilization, doing at present, by the teeth being ground together, what the coarser food of the ancients did in the process of mastication.

COLOURING GOLD.

The following directions for colouring gold alloys are given by Herr E. Schlosser, of Vienna:—

Gold alloys, particularly those containing copper, acquire through repeated heatings during their manufacture, an unseemly brown or brownish black colour, caused by the oxide of copper, to remove which they are boiled or pickled in very dilute sulphuric or hydrochloric acid, according to the colour they are to have. If we have an alloy containing only gold and copper, either sulphuric or hydrochloric acid is employed, for gold is not attacked by either of them, while the oxide of copper dissolves so easily that after the pickling the articles have the colour of pure gold, for the surface is covered with a thin film of gold. If the alloy consists solely of gold and silver, the liquid employed is nitric acid, and the articles are left in it a very short time; the acid dissolves a small quantity of silver, and the articles acquire the colour of gold. If the alloy contains both copper and silver, besides the gold, the method of pickling can be varied to suit the colour it is desired to give to it. If, for instance, it is put in sulphuric acid, the copper alone is dissolved, and the colour obtained is that of an alloy of gold and silver, for the surface consists of the two. If nitric acid were used, both copper and silver would be dissolved, and in this case the colour obtained would be that of pure gold. The articles are gently heated and allowed to cool again before boiling. The object of the heating is to destroy any grease or dust that adheres to it. If they are soldered with soft solder, they cannot, of course, be heated, and must be cleansed from grease and dust by first putting them in a strong lye, then washing with water and putting them in the acid. The acids are used dilute, usually in the proportion of one part of concentrated acid to forty parts of water. The articles are laid side by side in a porcelain or earthenware dish, and the dilute acid poured over them. From time to time one is taken out to see if it is yellow enough. When the proper colour has been reached they are washed in clean water and dried. While this pickling is merely to bring out the colour of the gold, the colouring of gold has for its object the imparting to inferior goods of the appearance of fine gold. Different mixtures can be employed for colouring gold, two of which are given below as giving very good results. Mix together two parts of saltpetre, one part of table salt, and six parts of alum, with six and a half parts of water, and warm the mixture in a porcelain vessel. As soon as it begins to rise add one part of hydrochloric acid, and bring the contents of the vessel to a boil, stirring in the meantime with a glass rod. The articles to be coloured, suspended on hooks made of strong platinum wire, or of glass, are first dipped in sulphuric acid and then put in the slowly cooking solution last described, and moved too and fro in it. In about three minutes they are taken out and dipped into a large vessel of water so as to see what colour they are. If the desired shade is not yet attained they are dipped in again as often as necessary until they do have it. In the subsequent dippings they are only left in the liquid for one minute. Articles coloured in this way have a light yellow colour, but matte appearance. They are repeatedly washed in water to remove the last trace of the liquid, and then dried in soft sawdust that has been warmed. Instead of drying in sawdust they can be dipped in hot water the last time and left in there a few seconds, and when taken out the water that hangs on them will evaporate almost instantly. The second method of colouring gold alloys is by means of a mixture of 115 parts of white table-salt and 230 parts of nitric acid, with enough water added to dissolve the salt. This is boiled down to a dry mass of salt. The salt is put in a porcelain dish and 172 parts of fuming hydrochloric acid poured over it and heated to boiling. As soon as the suffocating odour of chlorine is perceived the articles to be coloured are dipped in, and the first time they are left eight minutes in the liquid. In other respects the treatment is the same as above described. Articles polished previously do not require polishing again. Care must be taken not to inhale the dangerous gas; the operation must be conducted under a draught or out of doors.—*English Mechanic.*

THE GENERAL MEDICAL COUNCIL.

THE General Medical Council met on June the 27th, and was in session for eleven days. The Dental Committee reported as follows upon the case of (*a*) THOMAS JOHN MOLLOY:—

"The Dental Committee have considered the case of Mr. Thomas John Molloy, a Registered Dentist, referred to them by the Executive Committee to ascertain the facts, and have taken evidence.

"The Committee find that Mr. Thomas John Molloy was registered on the 22nd day of November, 1878, as 'in practice before July 22, 1878'; and that in 1879 the said Thomas John Molloy was registered, with the additional Qualification of 'Licentiate in Dentistry of the Faculty of Physicians and Surgeons of Glasgow,' by virtue of a Diploma then produced, and bearing date the 27th day of August, 1879.

"The Committee further find that in pursuance of the power vested in the Faculty of Physicians and Surgeons of Glasgow, the President and Council of the said Faculty have, at a meeting held the 5th day of June, 1882, removed the name of the said Thomas John Molloy from the list of Dental Licentiates of the said Faculty.

"The Dental Committee further find that in consequence of the said order, the said Thomas John Molloy has ceased to be a Licentiate of the Faculty of Physicians and Surgeons of Glasgow."

(*b*) On the case of VALLECK CARTWRIGHT MALLAN:—

"The Dental Committee having considered the case of Mr. Valleck Cartwright Mallan, a Registered Dentist, referred to them by the Executive Committee to ascertain the facts and take evidence, find that Mr. Valleck Cartwright Mallan has been carrying on the practice of a Dentist in his own name at 173, Praed Street, and at 64, High Street, Notting Hill; at 94, Praed Street, as Charles Smith, and at 106, Edgware Road, as C. Valleck.

"Also, that the said Mr. V. C. Mallan attended before the Committee in person, admitted the above facts, and expressed his readiness to submit to any suggestion which the Council should make."

(*c*) On the cases of J. T. LAMBERT and JOSEPH WALKER:—

"With reference to the cases of John Thomas Lambert and Joseph

Walker, referred back to them by the General Council, the Committee find that John Thomas Lambert and Joseph Walker have now answered the communications addressed to them, and that they are in the same position as regards qualification as the other persons who are on the *Dentists' Register*, and who answered in due time the letters sent them by the Council."

It was Resolved:—"That as, by the Report of the Dental Committee, it appears that Mr. Thomas John Molloy has ceased to be a Licentiate in Dentistry of the Faculty of Physicians and Surgeons of Glasgow, his Qualification as Licentiate be erased from the *Dentists' Register*, and that the Registrar be ordered to erase such Qualification from the *Register* accordingly."

The following motion was moved by Dr. QUAIN and seconded by Dr. AQUILLA SMITH:—

"That the Council, having considered the Report of the Dental Committee on the facts of the case of Mr. V. C. Mallan, are of opinion that the practice brought under the notice of the Council is one which is inconsistent with the law and with professional propriety; but the Council, if it receive the assurance of Mr. Mallan that the practice shall be discontinued, will not think it necessary to take further steps in the present case."

To this an amendment was moved by Dr. LYONS, and seconded by Sir W. GULL:—

"That this Council direct Mr. Mallan to remove from his place of practice any name but his own or that of a registered Dentist in partnership with him."

The amendment was lost, and the original motion was then put to the vote and agreed to.

Mr. Mallan was then called before the Council, and he gave his assurance that the practice complained of should be discontinued;

Whereupon the Council resolved:—"That the General Medical Council, having received Mr. V. C. Mallan's assurance that the practice which has been complained of shall be discontinued, do not think it necessary to take any further action in this case; and that this Resolution be communicated to Mr. Mallan by the Registrar."

With regard to J. T. Lambert and Joseph Walker, it was moved by Dr. PITMAN, seconded by Dr. AQUILLA SMITH, and agreed to:—"That the Report of the Dental Committee not having put the Council in possession of evidence to show that John Thomas Lambert and Joseph Walker were not *bonâ fide* engaged in the practice of Dentistry, the Council is therefore not prepared to order the removal of their names from the *Dentists' Register*."

The following communications in regard to Dental Registration were read:—

(*a*) Extract from the Dental Minutes of the Executive Committee's Meeting of July 28, 1881:—

"Read:—The following communication from the British Dental Association, together with the 'opinion' and 'explanatory Resolution' therein referred to:—

"40, Leicester Square, *July 16th*, 1881.

"DEAR SIR,—I am requested by the Business Committee of British Dental Association to forward to you the accompanying opinion, and to beg that you will place it before the Medical Council, together with the enclosed explanatory Resolution.*

"I am, dear Sir, yours very truly,
"JAMES SMITH TURNER,
"Hon. Sec. B.D.A.

"The REGISTRAR of the
"General Medical Council."

"Resolved:—That the Committee acknowledge the receipt of the foregoing communication, and inform Mr. J. S. Turner that, in the opinion of the Committee, the steps requisite to be taken to try the correctness of the course taken by the General Council, under the advice laid before it, rest with the Dental Association, and not, as suggested in the opinion now forwarded, by the removal of a name which, in the judgment of the Council, is registered in conformity with law."

(*b*) Extract from the Dental Minutes of the Executive Committee's Meeting of November 11, 1881:—

"Read:—The following Communication from the British Dental Association, in regard to the Resolution contained in foregoing extract (*a*):—

"British Dental Association (Incorporated June, 1880),
"40, Leicester Square, W.C., *October* 15, 1881.

"SIR,—I am directed to acknowledge the receipt of your communication, dated

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* The explanatory Resolution is as follows:—"That in strict conformity with the practice uniformly followed of placing before the Medical Council any facts or opinions bearing upon the administration of the Dentists' Act of which the Association may have become possessed, the joint opinion of Sir John Holker, Mr. R. S. Wright, and Mr. G. A. R. Fitzgerald, upon the meaning of Section 6, Subsection (*c*), be at once forwarded to the Medical Council; that the Association venture to hope the Council will cause to be placed on their Minutes the accompanying joint opinion, together with the high legal opinion of Mr. (now Mr. Justice) Bowen, read before the Council in July, 1880, with the opinion, also then read, of Mr. G. A. R. Fitzgerald: and that the Association earnestly hope in the presence of a great preponderance of high legal opinion in favour of a correction of the *Dentists' Register*, the Council will restore to the *Register* the recently erased descriptive terms 'with Medicine,' 'Pharmacy,' etc.: and at its convenience proceed to the correction of the *Register* by the erasure of names registered in the midst of doubt, or take such other steps as may lead to the production of a *Register* legally correct."

August 3rd, 1881, and in reply thereto to state, for the information of the Medical Council, that the Representative Board of the British Dental Association is advised that the question lately raised respecting the correction of the *Dentists' Register* cannot be settled by action taken under Section 35 of the Dentists' Act: furthermore, that inasmuch as the Council, in full session, on February 3rd, 1881, declared that sufficient evidence of error in registration had not been adduced to justify the erasure of the names under consideration, it be asked that the memorial, with the appended legal opinions—constituting strong additional evidence—addressed to the Council, and in part considered by the Executive Committee on the 28th of July, be laid before the Council at its next session.

"On behalf of the Representative Board of the British Dental Association,

"I remain, yours obediently,
"JAMES SMITH TURNER,
"Hon. Sec. B.D.A.

"W. J. C. Miller, Esq., B.A.,
"Registrar of the General Medical Council."

"Resolved:—That the several documents and legal opinions in possession of the Council having reference to registration under the Dentists' Act be placed in the hands of Mr. Farrer, the Solicitor to the General Council, for the purpose of his further advising the Committee thereon."

(*c*) Extract from the Dental Minutes of the Executive Committee's Meeting of January 6, 1882:—

"A communication was made by the Solicitor of the Medical Council in regard to the foregoing clause (*b*) of the Dental Minutes of the Executive Committee's Meeting of November 11, 1881 (Minutes, Vol. XVIII., pp. 255-6)."

The Solicitor of the Council, Mr. Farrer, having reviewed the several communications submitted to him, stated that he could not advise the Medical Council to act otherwise than they had done under the advice of Counsel.

It was moved by Dr. Storrar, and seconded by Dr. Pyle:—

"That the opinions of Mr. Bowen, Mr. Fitzgerald, the Solicitor-General, and Sir John Holker, in regard to the registration of Dentists under the Dentists' Act (1878), be entered in the General Council's Minutes."

An Amendment was moved by Sir W. Gull, seconded by Dr. Lyons:—

"That the opinion of Counsel for the guidance of this Council, for the registration of Dentists, be considered confidential, and be not entered in the Council's Minutes."

The Amendment was then put to the vote as an Original Motion and carried.

The following Resolution, moved by Mr. Turner, and seconded by Mr. Simon, was agreed to:—

"That the Council are not prepared to take steps as suggested by the Dental Association to erase names from the *Register* which have been placed therein by the Council under legal advice."

The following letter from Prof. Turner, in regard to Dental Students, was read:—

"Edinburgh, *October* 31, 1881.

"My dear Mr. Miller,—As you are aware, during the autumn some questions have arisen as to the meaning of the Regulations of the General Medical Council relating to the education, preliminary examination, and registration of Dental Students. I am desirous that you should bring the matter before the Executive Committee, so that more specific regulations may be framed.

"1. In the 'Dental Curriculum' approved by the General Medical Council nothing is said of apprenticeship. A certificate of having been engaged four years in professional study is required. Medical Students are allowed to count one year of apprenticeship as one of the four years of professional study. Ought not Dental Students to be put on the same footing?

"2. Three years' instruction in Mechanical Dentistry is required. It is not stated if these years are to be during the four years of professional study, or may be taken, in whole or in part, antecedent to registration as a Dental Student.

"3. It seems advisable, therefore, that the expression 'four years in professional studies,' should be more precisely defined. Is it to mean: (*a*) four years in a dental school or hospital; or (*b*) may one year of apprenticeship count as one of the said four years; or (*c*) may one or two years passed as a Mechanical Dentist in a dentist's workshop similarly count?

"4. May the time spent under (*b*) and (*c*) of (3) be regarded as a legitimate portion of the specified four years, even if spent before passing the preliminary examination in Arts, that is to say, before registration? It seems to me only reasonable that some portion, if not the whole, of the three years to be spent in Mechanical Dentistry should be allowed, even if taken before registration, since there is nothing rendering a literary examination necessary previous to entering on workshop duties, as there is prior to entering on a course of scientific lectures; and secondly, it will scarcely be practicable to go through an efficient training in the workshop, if during the same period the Student's time is to be occupied in attending several courses of lectures, and in following the practice of a dental hospital.

"Believe me, very truly yours,

"WM. TURNER."

Professor Turner's letter having, by order of the Executive Committee, been forwarded to the various Dental Examining Boards, with a request that they would take it into consideration and favour the Executive Committee with any observations thereon, the following communications were received in answer thereto:—

(*a*) From the Royal College of Surgeons of England.

"Lincoln's Inn Fields, W.C.,
"*22nd* day of *December*, 1881.

"Sir,—I have submitted to the Council of the College your letter of the 22nd ultimo, forwarding a copy of a letter from Professor Turner in reference to Dental Students, and a copy of a resolution thereon of the Executive Committee of the General Medical Council, and requesting that the Council will favour the Executive Committee with their opinion thereon, and I am desired to reply thereto as follows: First, in respect of the questions raised in Professor Turner's letter under the head (*a*); and, secondly, in reference to the Resolution of the Executive Committee under the head (*b*) viz. :—

"(*a*) Professor Turner's questions.

"(1) That the four years' curriculum for a Dental Student required by the regulations of the College includes apprenticeship.

"(2) That the three years' instruction in Mechanical Dentistry required by paragraph 9 of the College Regulations can be taken concurrently with the other parts of the curriculum, and be included in the four years, but not in any case before the passing of the necessary Preliminary Examination.

"(3) That, in the opinion of the Council, it is not necessary to more precisely define the expression 'four years in professional studies,' as from the College Regulations, it is believed that Candidates for the Dental Diploma clearly understand that the whole curriculum of professional study can be completed within the four years; that the expression 'four years' does not mean (*a*) 'four years in a Dental School and Hospital'; that one year of aprenticeship (*b*) does count as one of the four years; and that two years passed as a Mechanical Dentist (*c*) do count as two of the four years, as it will be seen, on reference to paragraphs 3, 4, 5, 6, 7, 8, 10 of the College Regulations, that the rest of the curriculum can be completed in two years.

"(4) That the time spent under (*b*) and (*c*) cannot, by the College Regulations, be considered as a legitimate portion of the specified four years, if spent before passing the Preliminary Examination in Arts, for as has already been stated in answer to Question 2, in no case can any part of the curriculum be taken out before passing the Preliminary Examination.

"(*b*) The Resolution of the Executive Committee :—

"That the Council cannot consent to admit to examination under conditions more or less exceptional, Candidates who have commenced the study of Dentistry since the 8th of September, 1859, inasmuch as the curriculum of professional education laid down in the College Regulations has been for many years in force, and has been required hitherto of all Candidates excepting those who either had commenced the study of Dentistry or had been in practice as Dentists before the above-mentioned date.

"I am, Sir, your obedient servant,
"EDWARD TRIMMER,
"Secretary.

"W. J. C. MILLER, Esq."

(*b*) From the ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

"The Royal College of Surgeons having received a communication from the Medical Council relative to certain points in connection with the Dental Curriculum and Examinations, as well as in respect to Clause 37 of the Dental Act, the President's Council, along with the Dental Examining Board, met for its consideration, when it was resolved that the following reply should be sent to the Medical Council :—

"The principal questions submitted for the opinon of the College seem to be as follows :—

"(1) What constitutes 'a year' of professional study?

"(2) Whether an Apprenticeship, general or merely mechanical, and current during such a year, should be counted as professional study?

"(3) Whether the three years' mechanical instruction in Dentistry, required by the curriculum, may be taken *before* or must be taken *after* passing the Preliminary Examination?

"In reference to these questions the College has to submit :—

"(1) That 'a year' of professional study means a Winter and a Summer Session spent—*subsequently* to the Preliminary Examination—in following out such subjects as are prescribed in the Medical Council's tabular curriculum of March 26th, 1879.

"(2) That such a year may be filled up by an apprenticeship or by a period of instruction in mechanical dentistry—always provided such apprenticeship or period of instruction be *subsequent* to passing the Preliminary Examination and in accordance with the prescribed curriculum.

"(3) That the prescribed period of three years' instruction in mechanical dentistry, as specified in the curriculum, ought to be allowed to be taken at the option of the candidate, either *before* or *after* the Preliminary Examination. But if taken before the Preliminary Examination it should not be allowed to count as any portion of the four years' professional study, or among the professional studies subservient for filling up these four years. At the same time the certificate of such three years' *extra mural* instruction should in itself be valid, whether counting as such professional study or not.

"In reference to Clause 37 of the Dentists' Act, and to the question of admitting to the *Dentists' Register* and to Examinations candidates whose apprenticeship terminated before January 1880, this would appear capable of being more easily arranged where the *commencement* instead of the *termination* of such apprenticeships made the ground of admissibility. In this way the longer apprenticeship would not be placed at a disadvantage to the shorter one, supposing both to commence at the same time and only the shorter one to terminate by 1880. The difficulty might be met by admitting to the *Register* and to Examination *sine curriculo* all those whose apprenticeship began before 1875. The *sine curriculo* Examinations, however, to be in all respects the same as for *curriculum* candidates, with the exception that no Preliminary Examination should be required. Signed in name and by appointment of the Royal College,

"JAMES ROBERTSON, Secretary.

"Edinburgh, *December* 15, 1881."

(*c*) From the FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

"26*th December*, 1881.

"SIR,—Referring to your communication of 22nd November ultimo, I am instructed to inform you that the Council of the Faculty are of opinion:—

"(1) That Dental Students should be engaged in acquiring professional knowledge for a period of four years subsequent to Registration.

"(2) That of this period apprenticeship or employment in the work of Mechanical Dentistry may count for *one year*.

"(3) That of the three years to be spent in acquiring a knowledge of Mechanical Dentistry, the entire may be spent antecedent to Registration.

"Yours truly,
"ALEXANDER DUNCAN,
"Secretary.

"W. J. C. MILLER, Esq., B.A."

(*d*) From the ROYAL COLLEGE OF SURGEONS IN IRELAND.

"Dublin, *January* 14, 1882.

"GENTLEMEN,—With reference to Professor Turner's letter, I am directed to inform you that this College has not hitherto admitted to its Examination for the Diploma in Dental Surgery other than gentlemen on the *Dental Register*, and, as at present advised, the question referred to will not arise.

"I have the honour to append, on the other side, a copy of a resolution passed by the Council of this College, from the terms of which you will see that the period of Examination, *sine curriculo*, has been extended to all such gentlemen who have had their names inserted on the *Dental Register* in accordance with the provision of the Dental Act. These gentlemen are entitled to every legal privilege, and seek in addition collegiate recognition, which, if worthy, they obtain after a searching examination, and for seeking which they deserve commendation.

"I have the honour to be, Gentlemen,
"Your obedient servant,
"J. STANNUS HUGHES,
"Secretary of Council.

"To the PRESIDENT and MEMBERS of the
"General Council of Medical Education and Registration.

"Resolution passed at a meeting of the President and Council of the Royal College of Surgeons, Ireland, held on December 15, 1881:—

"Resolved:—That in order to bring the Regulations of this College into conformity with those of the two Colleges which are giving Examinations, *sine curriculo*, in Dental Surgery, the Regulation by which the Dental Examination, *sine curriculo*, in this College shall cease on August 1, 1881, be rescinded, and that in place thereof the Regulations of the Scotch Licensing Bodies be adopted, viz.:—

> "'That Candidates whose names appear on the *Dental Register*, shall be admitted to Examination, *sine curriculo*, and that the same be notified to the General Medical Council, together with the reasons that have influenced this Council in coming to this determination.'"

Mr. TURNER moved and Dr. HERON WATSON seconded, and it was agreed to:—

"That one year's *bonâ fide* apprenticeship with a registered dental practitioner, after being registered as a dental student, may be counted as one of the four years of professional study."

Also, "That the three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the dental student either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration."

It was resolved:—"That any or all of the Qualifications in Schedule (A) of the Medical Act be registrable by registered Dentists in the *Dentists' Register.*"

The following Memorial from the British Dental Association was read:—

"The Representative Board of the British Dental Association, anxious that the standard of Dental Education, whereof the Medical Council are the appointed guardians, should be maintained at a high and uniform level throughout the United Kingdom, beg respectfully to direct the attention of the General Medical Council to the completion of the time during which, in accordance with the terms of the Council's Minutes (July 16, 1879), examinations should be conducted *sine curriculo* by the Royal College of Surgeons in Ireland.

"In the opinion of the Board the time has now arrived when exceptional examinations should be altogether discontinued by all the Licensing Bodies in favour of strict uniformity of educational test already adopted by one or two, otherwise the value of the Licentiateship will be greatly deteriorated as a guarantee of professional competence.

"We venture to remind the Council that, by Section 22 of the Dentists' Act, they have the power to supervise these examinations; and we would suggest that this power might now with real public advantage be exercised.

"We have the honour to be, your obedient servants,

"JOHN TOMES, THOMAS A. ROGERS,
EDWIN SAUNDERS, THOMAS UNDERWOOD,
JAMES PARKINSON, JAMES SMITH TURNER, Hon. Sec. B.D.A.
"Members of the Business Committee.

"British Dental Association,
"40, Leicester Square, London, W.C.
"*March* 7, 1882."

Then was read a letter, referred to the General Council by the Executive Committee, from Mr. Barnard Lee, a registered Dentist, complaining that "at 199, Potobello Road, Notting Hill, there is a man evading the provisions of the Dentists' Act (1878), by announcing himself as a Dentist, and practising as one, but *using no name.*"

Also a letter, referred to the General Council by the Executive Committee, from Mr. J. W. Sadler, a registered Dentist, calling the attention of the Medical Council to the fact that a late pupil of his, "T. L. Callender, not being qualified, has commenced practice in Burton-on-Trent, and announces himself as in practice with Mr. Godding, M.R.C.S., Surgeon Dentist, though there is no Mr. Godding in Burton-on-Trent."

The following letter from the British Dental Association was read;—

"40, Leicester Square, *June* 27, 1882.

"GENTLEMEN,—I have been directed by the business Committee of the British Dental Association to ask for permission to prosecute Mr. T. L. Callender, of Bridge House, Burton-on-Trent, and Mr. Godding, representing himself as a Member of the Royal College of Surgeons, whose proper address is not at present known to the Committee, but who is supposed to be Mr. J. R. Godding, of 67, Oakley Square, London, for infringing the Dentists' Act.

"The Committee also respectfully ask the Council to consider the propriety oı granting to the Representative Board of the British Dental Association, or to the Honorary Secretary of the Association, the power to take up any case which may arise in the intervals between the sittings of the Council; and, if it be within the powers of the Council, to grant at its present sitting this concession to the Representative Board. "I remain, gentlemen,

"Your obedient servant,
"JAMES SMITH TURNER,
"Hon. Sec. B.D.A.

"To the GENERAL MEDICAL COUNCIL."

It was moved by Sir W. GULL, seconded by Dr. HUMPHRY, and agreed to:—

"That this Council give to Mr. James Smith Turner the power to take up the cases of Mr. Callender and Mr. Godding, referred to in the foregoing letter."

This was the whole of the Dental business, and the Council adjourned on July the 8th.

DENTAL HOSPITAL OF LONDON.

ANNUAL DISTRIBUTION OF PRIZES.

THE Annual Distribution of Prizes to the successful students attending the medical school attached to this Institution, took place at Willis's Rooms, St. James's, on the evening of July the 6th. Mr. Edwin Saunders, F.R.C.S., occupied the chair.

The Chairman called upon the Dean, Mr. T. F. K. UNDERWOOD, to read his Report for the past year, which was as follows:—

This year fortunately I need not commence my Report with any remarks of a depressing nature, as the state of things around us has forced me to do for some years past, and I am thankful to say I shall hope to show that in spite of a disturbed state of the atmosphere which makes men anxious, we have been enabled quietly to pursue the even tenor of our ways and to continue establishing and cementing the work which it is the special object of this London School of Dental Surgery to carry out. Many provincial hospitals are springing up all round us, we are glad to say, and yet we have as many students as we have room for, and their work is as satisfactory as we could wish, which I venture to submit is a very hopeful state of things.

The number of entries last winter was exceedingly good—it has seldom been better—and this is an important matter, for without students the hospital could not be worked, and the poor, who are so largely dependent upon us for relief, and who are, therefore, chiefly concerned in our prosperity, would suffer. Again I am able to report a Pass List of 100 per cent. at the last examination of the Royal College of Surgeons. Every one of our candidates passed, and passed *well*. With this encouraging and pleasant fact before us we should be ungrateful if we did not say how greatly this is due to the work of our medical tutor, Mr. Morton Smale; he deserves our sincere thanks for these successful appearances at the College of Surgeons. The honour of the School was largely at stake the other day, though I was not at all nervous, for our late excellent House-Surgeon and Assistant House-Surgeon were among the candidates.

It is a great pleasure to us this year to have our kind friend, the founder of the Scholarship which bears his name, in the chair; and the Saunders Scholar for this year, Mr. S. C. Buckland, will have the honour of receiving it from the hands of our deeply valued and generous friend. I need not describe to you how Mr. Buckland came to gain this distinction, the blue ribbon of our School, for the Prize List will explain it all. Mr. Buckland, directly he came here, began to take prizes and certificates, and I don't know when he means to stop, but this I do know, that he deserves our heartiest congratulations on his well-earned success. Our demonstrators, Messrs. Rogers and

Ackery, have increased our debt of gratitude to them, if that is possible, since last year. Upon them devolves the task of personally teaching and superintending the work of each student, and if any of you could spend a morning with us at Leicester Square, and could see the demand made upon their patience and their skill, you would appreciate the difficulty I find in suitably expressing the obligations we are under to these gentlemen.

Our late able lecturer on metallurgy, Mr. Louis, has resigned, having accepted an appointment abroad, and we have been fortunate enough to secure the services of Professor Huntingdon, of King's College, London. He has no prize list to exhibit, simply because no lectures were given last winter, the course having been removed to the second winter Session. We have had two changes in the staff in the last year; in the place of Mr. Fox, Mr. Truman, an old student of this hospital, was elected, and our friend of many years standing, Mr. Coleman, Chairman of the Medical Committee and Senior Surgeon, whose resignation we so deeply regret, but whom we hope to keep with us as a lecturer on Dental Surgery and Pathology for many years to come, has been succeeded by Mr. George Parkinson, who bears a deeply honoured name among us, and one which has stood among the foremost in our ranks for very many years.

It is right that I should take this opportunity of mentioning the valuable help the staff have received during the past year from our successive House- and Assistant House-Surgeons. These posts are filled by senior students, who are selected from among the best men of their year. Mr. Blackmore our late, and Mr. Hern, our present very able and efficient House-Surgeon, together with Mr. Harrison and Mr. Cornelius, our late and present Assistant House-Surgeons, deserve our very sincere and hearty thanks for the excellent manner in which they have been, and are, carrying out the duties of their offices, and I am particularly grateful to them for the way in which, whilst they retain their popularity, they assist me in maintaining the necessary discipline.

Mr. Buchanan, of Glasgow, still continues his generous gift to us of an annual prize of five guineas; the subject for this year you will see upon the Prize List. Mr. Buchanan began to think it was time he came himself, and was most kindly intending to do so when, I deeply regret to say, illness obliged him to go abroad. The prize for Operative Dental Surgery is, this year, gained by Mr. Walter Harrison, our late Assistant House-Surgeon. The examination for this prize extends over three days, and embraces the treatment of irregularities, extractions under anæsthetics, and stoppings, and the prizeman must, therefore, prove himself to be the best man "all round" in Operative Dental Surgery. The student's prize for their own Society, this year, is gained by Mr. Hern, whom all who have been to our meetings for the last two or three years will recognise as a very brilliant man. He is by this time so thoroughly accustomed to coming up here and receiving prizes by the armful, that I do not suppose to-day's ordeal will in the least disturb his equanimity, in spite of his natural modesty.

I find that with my utmost efforts to be terse, my Report this year considerably exceeds in length that of last, and, therefore, I must bring it rapidly to a close. It is a great thing in these days not to be obliged to confess to falling off, but it is very gratifying to be able to "report progress," and I trust our friends, who have shown practically their interest in our work, by coming here to-day, will think that we can show a fair record of work done. Finally I beg to tender, on behalf of my colleagues and myself, our sincere thanks to those kind friends, especially the ladies, who have, no doubt, foregone many of the tempting engagements of the season to be with us to-day.

The following is the Prize List:—

THE SAUNDERS SCHOLARSHIP—

Mr. S. C. Buckland, Scholar for 1882.

Mr. BUCHANAN'S PRIZEMAN—

Mr. J. O. Butcher, for Essay on "Necrosis."

MECHANICAL DENTISTRY—

Mr. J. M. Ackland—1st Prize.
Mr. W. Harrison, } 2nd Prize.
Mr. J. O. Butcher, }
Mr. S. C. Buckland—1st Hon. Certificate.
Mr. A. H. Tester—2nd Hon. Certificate.
Mr. H. Baldwin—3rd Hon. Certificate.

DENTAL SURGERY AND PATHOLOGY—

Mr. S. C. Buckland—1st Prize.
Mr. A. H. Tester—2nd Prize.
Mr. J. M. Ackland—1st Hon. Certificate.
Mr. J. O. Butcher—2nd Hon. Certificate.
Mr. R. Edwards—3rd Hon. Certificate.
Mr. H. Baldwin—4th Hon. Certificate.

DENTAL ANATOMY AND PHYSIOLOGY—

Mr. S. C. Buckland—1st Prize.
Mr. J. O. Butcher—2nd Prize.
Mr. J. M. Ackland } 1st Hon. Certificate.
Mr. H. Baldwin }
Mr. W. Harrison—2nd Hon. Certificate.
Mr. J. Petherbridge—3rd Hon. Certificate.

OPERATIVE DENTAL SURGERY—

Mr. W. Harrison—Prize.
Mr. J. J. Andrew—Hon. Certificate.

STUDENT'S SOCIETY PRIZE, 1881—

Awarded for Paper on "Fractures of the Maxillæ and their Treatment," to
Mr. W. Hern.

The Lectures on Metallurgy having recently been transferred to the second winter Session of the Curriculum, there were no prizes to be distributed for that subject on this occasion.

Mr. Saunders then delivered the following address:—

Ladies and Gentlemen,—Occasions such as that at which we have just had the pleasure of assisting, possess an interest, not only for those who are connected by ties of consanguinity or of friendship with the *alumni* who have achieved distinction, but for all who are conscious of broad, human sympathies, and aspirations after intellectual progress. It is not only that we experience a pleasurable emotion on seeing the wreath placed on the brow of the intellectual athlete—the emotion that legitimately waits on success—but we feel constrained to regard with complacency the results of the emulation called forth in the struggle for supremacy, in adding strength to the moral fibre, and in carrying still higher the standard of professional merit. The mental strain and conflict, the waste and repair of brain tissue in the strife, even if at length the goal should not be reached, will be found to yield a rich harvest, in bracing the mind, in awakening and stimulating the perceptive faculties, in strengthening the memory and the power of assimilating knowledge—many-sided and various, and on that account most valuable to the specialist. For without sympathising with those who set their faces against special training, special institutions, and special practice (with a virulence proportioned to their want of information as to what is comprehended under the head of such special knowledge), and without admitting that the specialist is necessarily a man of one idea, or of limited intellectual range, there can be no doubt that it is desirable that he should be from time to time refreshed by excursions outside the sphere of his own speciality. The perpetual recurrence of a similar class of cases, with the routine treatment involved, affording few opportunities of novel or original observations, cannot but have a benumbing and enervating effect on the mind. And at no period of his subsequent career will it be so easy for the practitioner to throw himself quickly and entirely into other lines of thought. For, with the lapse of time, the environment of daily habit, and the exigencies of practice, he will find it increasingly difficult to disengage himself from the deepening groove of his own speciality. Thus there is a real and personal benefit outside and beyond the tangible symbol of success, not to be enjoyed exclusively by the victor, but which is common, though possibly not in the same degree, to him who fails, and to him who wins the prize. To both alike come health and renewed mental vigour from the struggle and heat of the chase; and so far from the time being lost, which was expended in an outwardly unsuccessful contest, it will be found that a measurable and substantial good has been gained. Thus, in this case, as in many other instances in human affairs, the law of compensation becomes manifest, and another illustration is afforded of the truth of the axiom that no good deed is lost, and that no honest work is finally and altogether barren of good result. This, I think it will be admitted, is a very real and solid ground of consolation for those who are not included in the roll of prize-winners, inasmuch as they hold in indefeasible possession the substance of solid acquisition, though they are unable to point to the outward and visible sign of success. To the holders of the much-coveted and well-earned prizes, we can only offer our hearty congratulations and good wishes, not to say, confident hopes, of a career in harmony with this brilliant promise. Nor can we fail to be struck with the hearty plaudits ungrudgingly given by competitors who, in a thoroughly English spirit, thus unselfishly give vent to their generous enthusiasm. And now, in accordance with established precedent, it would be my duty to exhort the prize-holders not to remain satisfied with the position to which they have attained, but, far from feeling content with what has been accomplished, to persevere and strive for further and greater achievements. And then I should turn to the uncrowned, and bid them not to be discouraged, but to resolve with stern determination to turn defeat into a glorious victory by renewed application and diligence. But, gentlemen, I forbear, and I fancy I hear you say, "All this we know and have heard before." Be it so, but I will make one reflection; it is this—that a knowledge of human nature and of mental idiosyncracy, should make us hesitate to accept failure at an examination as an unerring proof of incapacity, or the converse as an unfailing guarantee of professional pre-eminence. A highly nervous temperament, a temporary obscuration of memory, a passing ailment or similar unfavourable physical condition, occurring at the critical time of the ordeal of examination, may prevent an otherwise well-prepared candidate from doing justice to himself, in bringing out the full measure of his attainments.

The department of surgical practice of which you have made choice, and to which you have resolved to devote your life-long energies, with a success and distinction sufficiently predicated by the proceedings which have just taken place in this room, is at once exacting and important. It is exacting from the time and fatigue demanded by the operations which it embraces, still further complicated and impeded in no inconsiderable proportion of cases by the sensitive condition of the structures to be operated upon; rendering the proceedings alike irksome both to operator and patient. Although here again the law of compensation comes to our aid, as in the great majority of cases where no such morbid sensibility is met with, the patient experiences a lively sense of gratitude for relief from suffering, and for the preservation of a valuable organ. Again it is exacting in the amount of patience and forbearance required in assuaging the unreasonable apprehensions or expectations, as to the time and manipulation necessary, on the part of some patients. From all which it will be seen that a courteous demeanour, a kind manner, inexhaustible patience and dextrous manipulation are indispensable to the highest success, more especially if the practice should lie amongst highly-born, delicately nurtured and sensitively organised natures. It is important no less on account of the almost universality of the class of ailments of which it takes cognizance, than of the amount of suffering to which they give rise. It is a well-worn common-place that no physical ailment obtains less sympathy, and yet there is none more intolerable while it lasts, or which is, in its effects, more prostrating and intellectually more absolutely paralysing than odontalgia. As was once well observed by an illustrious lady, who is conspicuously in sympathy with suffering or bereavement among persons of all sorts and conditions: "Yours is the most useful of all branches of surgery, for while a certain proportion of mankind may require the services of the Oculist or of the Aurist, all, almost without exception, have need sooner or later of the Dentist."

In addition to the anatomical and surgical teaching which is a prerequisite common to all branches of the healing art, a certain personal aptitude is necessary to the successful pursuit of dental surgery. And foremost among the indispensable requisites of the dental surgeon is the possession of a strong yet gentle hand. It is well known that it has long been found convenient to recognise two great divisions of the healing art—Medicine and Surgery. The former takes charge of the more deeply seated structures, or organs, out of the range of vision, and whose condition is to be inferred chiefly by symptoms. The latter, under the appropriate name of Surgery, obviously a contraction of the old chirurgery, or hand-work, comprehends all those parts of the organism which can be reached and operated upon by the hand, or by the instruments which it calls to its aid. In all this class of cases the hand plays a very important part, but in none is it so largely and constantly employed as in the speciality with which we are concerned. It is obviously therefore of the first importance that the hand should be well formed, with fingers well endowed with nerve-power and sensibility, so as to respond to the will of the operator with quickness, with accuracy, and with delicacy of touch; so that the patient may experience a feeling of confidence that while there is an ample reserve of power, there will be no unnecessary violence. If it should seem to some, that this is a comparatively unimportant detail, and that I insist with undue emphasis on this matter of tenderness of manipulation, I would remind them that we are sometimes too apt to forget, in the ardour of doing the best for the case, that we are working on living sentient structure, and should therefore be extremely careful not to omit anything which may diminish the necessary discomfort. There are few indeed who would fail to appreciate the careful advoidance of unnecessary pain; and fewer still who would not be deterred from again seeking timely aid, by the recollection of a protracted operation, conducted in a brusque and unsympathising manner. And here we may not withhold our grateful tribute for that inestimable boon to humanity, anæsthesia, that "sweet oblivious antidote," which by harmlessly inducing temporary sleep of sufficient intensity to render the patient insensible to pain, robs ordinary operations of their sting and horror, and renders extraordinary, but sometimes vitally necessary surgical proceedings, possible, which were formerly almost prohibited on account of the shock to the system by which they were unavoidably accompanied. And it must never be forgotten that this priceless gift, this magical charm, by which what was hideous and revolting in the surgery of the past, or pre-anæsthetic period, has been transformed into the mild beneficence of an angel of mercy, had its origin in the speciality of Dental Surgery. The crucial experiment which first demonstrated to the world for all after-time, the feasibility of inducing, at will, temporary insensibility to pain, was the removal of a tooth. An operation which, simple as it may appear, is probably attended with as much pain while it lasts as any of the higher operations of surgery. Indeed it may be questioned whether, in the case of persons of highly sensitive organisation the nervous system could survive the agony thus experienced, if prolonged, of this happily transient operation. It is impossible to over-estimate the great gain to humanity in the conscious avoidance of pain on the part of the operator, as well as in the interest of the patient, or the magnitude of the addition to the sum of human happiness both to young and old which have resulted from this discovery. Nor should familiarity with its use ever be allowed to deaden within us our sense of its value. To how many of us have the recollections of childhood or youth been embittered by those hated and dreaded periodical visits to the Dentist? the impressions of which have not seldom remained deeply graven in our hearts through a long life! This realisation of the dream of the poet, this realistic translation of the magician's art, in its adaptation to the daily needs of suffering humanity, has now become a matter of every-day practice, and perhaps on that account is in some danger of being under-valued. If, however, it had suddenly become revealed to us as the discovery of the archæologist among the archives of a lost and buried city, or in any Egyptian papyrus, how intense and wide-spread would be the interest it would excite; and what pæans would be raised in honour of the skill and learning of the ancients! But it was reserved for our own times, which are signalised by two grand discoveries, either of which would singly have conferred immortality on the age: anæsthetics and the antiseptic treatment of wounds. By their combined action the proceedings and principles of modern surgery have been profoundly modified; and operations of the first importance in prolonging life, or in rendering life worth living, and which were formerly deprecated on account of their high mortality, are now matters of daily and accepted practice.

It might well seem superfluous to urge anything by way of justification for the existence of a special hospital and school for Dental Surgery, since the absolute necessity of making it a special branch of practice has long been recognised both in and out of the Profession. To those, however, who know something of the politics of the Medical Profession, it will be no secret that a Representative Committee for promoting reform in hospital management and administration has been of late drifting, under the insistance of a reactionist minority of its members, into a wholesale repudiation of ignoring of the utility and value of special institutions of the kind. That the needless sub-division of medical and surgical practice is to be deprecated and discouraged, is agreed on all hands; but that all specialities can be equally well taught at the large general hospitals, or that the support given to special institutions is so much subtracted from their income, are propositions which will not readily be admitted by impartial observers. It is simply idle and misleading to assert that the general hospitals are equal to the satisfactory discharge of all the functions of special institutions. It would be a present danger and manifest injustice to the inmates, not to say impossibility, for the general hospitals to receive cases of small-pox, fever, and infectious diseases generally; nor can they afford to encumber their wards with consumptive or other chronic forms of disease. And in our own speciality it may be fearlessly asserted that the space and light required, no less than the time and close attention necessary for operations in the present advanced state of the art, make it impossible to provide satisfactory means of instruction at a department of a general hospital. That a certain amount of knowledge on the subject, of great value to the country general practitioner, or to those whose destination is India or the Colonies, may be and is, thus obtained, will not be disputed; but to contend that the student can become fitted to hold his own among the accomplished practitioners of the present time by such training, is simply a delusion and a snare. The attempt, then, to blot out special hospitals must be regarded as altogether a retrograde measure; neither politic nor feasible; as futile indeed as the endeavour to stem the rising tide of progress, and one in which an appreciative public will not be easily induced to concur.

And now, lest I should become tedious and should have subjected your forbearance to too great a strain, I will conclude what I have to say by one reflection, which is at the same time a matter of congratulation. It is that our department of practice has not been invaded by the energetic and, shall I say, the aggressive of the superior sex; at least not in this part of the world. And if I regard this as a matter of congratulation, it is from no apprehension of rivalry and in no hostile spirit, but rather from a high sense of appreciation of all that is tender and gentle and graceful in the character of woman, which we would not willingly see sullied by contact with what, in a certain sense, is inevitably cruel and violent. Her fair hands were designed for delicate offices, and not for the amputating knife, the scalpel or the forceps. Let her exuberant philanthropy find its legitimate and appropriate sphere in supplementing the surgeon's work by the scarcely less divine work of nursing. By her comforting presence, by her low tones of encouragement and consolation, by her skilful and gentle smoothing of the pillow, by her intuitive perception of what is soothing and restful, by her woman's tact with which she knows how to gladden and brighten the sick-room with bits of colour, with flowers or sweet odours,—in all of which she is immensely man's superior,—in all these things she will be doing a far more useful work, than if she could be relied on, by doing violence to her nature, to undertake all the operations of surgery. A knowledge of anatomy and physiology may, indeed, stand her in good stead, by enabling her to correct errors in diet, and the management of health; and to avoid some eccentricities, more or less injurious in their effects on her delicate organisation, in the prevailing fashion of draping the human figure; and such knowledge will have the advantage of imparting authority to remonstrance. She may even combine with this, some knowledge of therapeutics, and may do useful work, to a certain extent, in medical treatment; but for the operations of surgery, she is by nature denied both the physique and the nerve. There is, indeed, no lack of energy and capacity for work in the woman of the period; and the burning words of scathing reproach, of our greatest living poet, are no longer applicable. He may no more apostrophise her in such strain as this:—

"Lady Clara Vere de Vere,
If time be heavy on your hands,
Are there no beggars at your gate,
Nor any poor about your lands?
Oh, teach the orphan boy to read,
Or teach the orphan girl to sew,
Pray Heaven for a human heart,
And let the foolish yeoman go."

The Lady Clara Vere de Vere of the present day has gained from Heaven a human heart, and in her new-born zeal, not only does all this, which she was formerly rebuked for neglecting, but she burns to make the homes of the poor, æsthetic, and charges herself with the task of elevating their tastes in their amusements, and in all phases of their life. She cannot be charged with leading a listless, aimless, frivolous existence, without care for aught but the amusement of the hour, and devoid of sympathy with the woes and worries and calamities which enter so largely into every-day life. But putting aside her pride of birth, and quitting her ancestral halls, she shows herself terribly in earnest to benefit her less fortunate brethren and sisters. Nay, she does not disdain to exhibit her charms and accomplishments to the working man at the music hall, or show her gratification at the plaudits of the Clerkenwell rough.

This new zeal, this wide sympathy with the human brotherhood, this throwing down of caste and pride of ancestry, may seem inordinate and ill-regulated, but it shows, at least, a healthy and sound heart; and a recognition of the grand old truth which underlies our common nature, and which the same great bard has so well expressed in the ringing stanza:—

"Howe'r it be, it seems to me,
'Tis only noble to be good;
Kind hearts are more than coronets,
And simple faith than Norman blood."

Mr. GREGSON proposed a vote of thanks to the Chairman for presiding. Mr. Saunders had been a great and liberal supporter of the hospital from the commencement, indeed it could scarcely have been established or carried on without his aid. He had also been a generous friend to the school, as was evidenced by the scholarship which he had endowed. His kindness in presiding that evening was therefore but a very small portion of the obligation which the friends of the hospital owed to Mr. Saunders.

Mr. SAUNDERS having briefly replied, the proceedings terminated.

BRITISH DENTAL ASSOCIATION.

For the Annual General Meeting of the British Dental Association, to be held at the Medical Institute, Mount Pleasant, Liverpool, on Friday and Saturday, the 25th and 26th instant, the following programme has been arranged:—

An Address by Mr. C. S. Tomes, on "Some of the Scientific Problems of Dental Surgery."

Mr. W. Bowman Macleod, on "Mechanical Dentistry: its Prospects and Possibilities."

Mr. H. E. Sewill, on "The Etiology and Pathology of Dental Diseases—What we know, and what we would like to know."

Mr. E. I. Ladmore will give a brief description of the structure and action of the Magnetic Mallet.

Mr. Oakley Coles will read a Paper on "Dental Literature."

Demonstrations, which will be given at the Liverpool Dental Hospital, have been promised by

Mr. H. C. Quinby, on "The Use of the Hand-Mirror in Operations on the Upper Incisors."

Mr. G. Cunningham, on "The Application of Amalgams to Contour Fillings."

Dr. Walker and Mr. Charles Claude Rogers will demonstrate the Application of the Electric Mallet to Gold Stopping.

Mr. Brunton will demonstrate how to do Vulcanite Work without a Flask. He will also endeavour to give a demonstration on Bonwill Crowns, and will exhibit some new adjustable Nerve Caps.

Mr. L. Matheson and Dr. W. Finley Thompson will also, if possible, give demonstrations in Gold Stopping.

WESTERN BRANCH.

The Annual Meeting of this Branch will be held on Saturday, August 5th, at the General Hospital, Cheltenham, Richard Rogers, Esq., L.D.S.I., President of the Branch, in the chair. The order of business will be as follows:—

11 a.m.: General Meeting; President's Address.

At the Afternoon Meeting, at 3 o'clock, Papers will be read on—

"The Filling and Treatment of the Permanent Molars between the ages of six and fourteen years," by Gascoigne Palmer, L.D.S.Eng.

"The Retention of Artificial Dentures," by T. Cooke Parson, M.R.C.S., L.D.S.Eng.

"Wasting of the Alveolar Process," by C. Spence Bate, F.R.S., L.D.S.Eng.

"On Celluloid," by W. A. Hunt, L.R.C.P., L.D.S.Eng.

"Galvanic Therapeutics with Anæsthesia," by W. V. Moore, L.D.S.Eng.

Papers have also been promised by Messrs. H. P. Fernald, D.D.S., L.D.S.I., and J. Lawes, L.D.S.I.

Mr. A. B. Verrier, L.D.S.I., will exhibit his Continuous Gum Process.

Mr. J. H. Gartrell will exhibit a new Celluloid Apparatus.

Messrs. Browne-Mason of Exeter, T. C. Parson of Clifton, and several other gentlemen have promised to give clinical demonstrations of various modes of gold-filling and pivoting.

LEGAL PROCEEDINGS.

PROSECUTION UNDER THE "DENTISTS ACT."

The case of V. C. Mallan *alias* Charles Smith, reported on page 323, was again resumed at the Marylebone Police Court, before Mr. Mansfield, on July 5th. Since the summons was adjourned, on May 31st (see page 323), the matter has been considered by the Medical Council, and the action of the Council in relation thereto is given on page 360.

It now appeared that Mr. L. Cartwright Davis, Dentist, of 140, Edgware Road (Mr. Mallan's cousin), who had obtained the consent of the Medical Council to prosecute, had delegated that authority to the Medical Alliance Association. Mr. Avory, the defendant's counsel, raised the objection that the Medical Alliance Association were not the proper parties to prosecute.

Mr. Mansfield allowed the objection, saying there was nothing in the Act or in English law to enable Mr. Davis to delegate his authority to a third party; and he dismissed the summons accordingly.

EXAMINATION PAPERS.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The following questions were given at the Final Examination for the L.D.S., held on July 19th:—

MEDICINE AND MATERIA MEDICA.

1. Pneumonia—What different kinds are now recognised? Enumerate the physical signs in the order they occur, and the typical range of temperature in a case of acute Pneumonia. Mention the peculiarities which occur in this affection in children and in old age.

2. Give the causes, sites, and symptoms of (*a*) arterial emboli, (*b*) venous emboli.

SURGERY.

1. Describe the dislocation of the head of the Humerus, the

treatment to be adopted, and the results which accrue from non-reduction.

2. Describe the symptoms of severe bruises, implicating internal parts or affecting all the textures of the limb. Mention the causes which produce such injuries. Give indications for forming a prognosis, and sketch the treatment to be pursued.

DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe minutely the normal conformations and markings of the fangs of the Molars, Canines and Incisors of the upper and lower jaws in man.

2. How is the process of shedding the Milk Teeth accomplished? What circumstances may retard it, and how do the germs of the permanent teeth originate?

3. Describe the course and distribution of the Superior and Inferior Divisions of the Fifth nerve, and mention particularly in what respect the Superior differs from the Inferior Division in regard to function.

DENTAL SURGERY AND PATHOLOGY.

1. In what cases of Diseases of the Pulp, should the Teeth be extracted or not, and why?

2. What are the General and Pathological conditions accompanying the Hæmorrhagic Diathesis, and what treatment, active and palliative, should be adopted in such cases when connected with Tooth Extraction?

3. What are the different remedial measures to be adopted in disorders of Teeth, and what circumstances should guide the practitioner in his decision?

PASS LIST.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

During the July Sittings of the Examiners, the following gentlemen passed their First Professional Examination for the License in Dental Surgery of the College:—

Francis Bromley, Hampstead,
William J. Mason, Chard, Somerset,
Frank H. Briggs, Leeds;

and the following gentlemen passed their Final Examination and were admitted L.D.S.:—

David Monroe, Edinburgh,
George John Lucas, Blackheath.

Editorial.

THE PRELIMINARY EXAMINATION.

The Medical Council has considered and decided the questions—When the Dental Student shall pass the Preliminary Examination, whether before, during, or after the required three years' mechanical instruction: Also, how much of the required period of four years' professional education shall be taken up with mechanical instruction or apprenticeship?

The Resolutions of the Council are published on page 366. These may be paraphrased as follows:—A Student cannot be registered as a Student until he have passed a preliminary examination: That, after being registered as a Dental Student, only one year's *bonâ fide* apprenticeship with a registered Dental Practitioner may be counted as one of the four years of professional study: That the three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a Student: But no period of such mechanical instruction shall be counted as part of the four years of professional study, unless taken after registration.

According to the foregoing a Student may pass the Preliminary Examination and serve, say, the usual four years' apprenticeship. As only one of those years can be counted as part of the four years of professional study, he will be required to spend other three years in acquiring professional knowledge. The work to be done in those three years is attendance at the lectures and practice of the General and Dental Hospitals, which, taken together, can be accomplished in two years; thus leaving a balance of one year. This the Student would probably turn to account by taking an Assistantship, rather than not do anything, or let the Hospital work occupy him for three years. Under those conditions the Student would be occupied for seven years; and that would be the case with the majority of Students.

The shortest possible time in which the Dental Curriculum, according to the foregoing regulations, can be faithfully complied with, is six years. For example, on the 1st January, 1880, commence three years of mechanical instruction; before January, 1882, the preliminary must be passed, and the Student registered; January, 1883, begin hospital work; on 31st of December, 1885, the four years of professional study will be completed—this including only one year of apprenticeship.

If our interpretation of the resolutions of the Medical Council relating to this matter be correct, we doubt if it coincides with the principle Prof. Turner wished to adopt.

AN APPEAL.

SELFISHNESS is natural, sympathy is natural also. These two qualities are included in the Christian principle of "My duty towards my neighbour." The philosophy of the precedence of duty to self or of duty to others will not now be dealt with. Possibly, "The end of man is an Action, and not a Thought, though it were the noblest;" yet a more comprehensive aphorism of CHARITY is found in "Infinite is the help man can yield to man." The charitable sympathy of the Dental Profession we are requested to excite to aid in the substantial relief of the widow and family of the late JOHN TALBOT ASHENHURST. The deceased was, at the age of thirteen, apprenticed as a Dentist to Mr. FRANÇOIS, of Judd Street, W.C., with whom he was, at intervals, altogether seventeen years. He was, also, at different times assistant to several other Dentists practising in London. Suffering from pulmonary phthisis necessitated frequent interruption in his work, which for some months before his death he was obliged to quite give up. The exigence of a family of five young children, ranging from ten to two years of age, told heavily upon a frugality sorely crippled by illness and its attendant expenses of the bread-winner. Consequently, the bereft ones are entirely unprovided for.

As the deceased was an Assistant, it is hoped that Dental Assistants will be induced to render what aid they can in this case of need. While the "mite" will not be despised, the larger tokens of sympathy will be welcome. The Rev. E. A. MIDWINTER, St. Paul's Rectory, Blandford Square, N.W., has undertaken the administration, to the best advantage, of the amount raised.

Subscriptions will be received by The Dental Manufacturing Company, Mr. JAMIESON, and Mr. RUTTERFORD.

GOSSIP.

Dr. Andrew H. Smith furnishes to the *New York Med. Jour. and Obstet. Rev.*, for June, 1882, the report of a committee on the use of sulphide of calcium for the purpose of preventing or diminishing suppuration. After giving the experience of several members of the Society, Dr. Smith concludes:—Judging from this limited number of cases, it would seem that we are warranted in concluding that in many cases of suppurative affections, ranging from the small pustules of acne to extensive suppurating surfaces, an appreciable, and often a very marked, benefit is derived from the use of calcium sulphide; suppuration which would otherwise take place being averted, or the quantity and duration of an existing discharge being lessened. At the same time, its action is not uniform; and in many apparently favourable cases it will fail entirely. The drug is somewhat prone to irritate the stomach: and this circumstance affords an indication for small doses frequently repeated instead of larger ones at longer intervals. One-tenth of a grain every two hours in acute cases will generally secure the full therapeutical action of the drug, but larger doses may sometimes be required, and some patients will bear well a grain three or four times a day. Even in small doses, the sulphide will occasionally produce headache, and the patient is usually more or less annoyed by eructation of sulphuretted hydrogen.

Bushmen of Tasmania report that they have met with specimens of eucalyptus measuring 200 feet from the ground to the first branch, and fully 350 feet in all. Until 1873 there was standing on the eastern slope of Mount Wellington, within four miles of Hobart Town, a eucalyptus measured at 86 feet in girth and more than 300 feet in height, and its ruined boll still forms a grim chamber in which many a merry party have enjoyed a picnic. In the Dandenong district at Fernshaw has recently been discovered a specimen of eucalyptus amygdalina, or almond-leaf gum, which has been accurately measured as reaching the enormous height of 380 feet before throwing out a single branch, and 430 feet to the top, and having a girth of 60 feet at some distance above the ground.

Medical men are very plentiful in the United States compared with other countries: 1 to every 600 inhabitants, while Canada has only 1 to 1,200 inhabitants, Great Britain 1 to 1,672, Germany 1 to 3,000. A higher standard of examination is recommended, and an all-round education insisted upon. Only five schools at present require the highest amount of study to qualify a full practitioner.

In the opinion of Herr W. Hemper the hardening of vulcanized india-rubber, which takes place with piping and other goods after a short period of use, is caused by the gradual evaporation of the solvent liquids contained in the india-rubber, and introduced during the process of vulcanization. Herr Hempel has made experiments for a number of years in order to find a method of preserving the india-rubber. He now finds that keeping in an atmosphere saturated with the vapours of the solvents answers the purpose. India-rubber stoppers, tubing, etc., which still possess their elasticity, are to be kept in vessels containing a dish filled with common petroleum. Keeping in wooden boxes is objectionable, while keeping in air-tight glass vessels alone is sufficient to preserve india-rubber for a long time. Exposure to light should be avoided as much as possible. Old hard india-rubber may be softened again by letting the vapour of carbon bisulphide act upon it. As soon as it has become soft it must be removed from the carbon bisulphide atmosphere and kept in the above way. Hard stoppers are easily made fit for use again in this manner, but the elastic properties of tubing cannot well be restored.

The sea is not everywhere a level surface in the geometrical sense. In all seas there is equilibrium of weight, and there are merely tendencies to equilibrium of level. M. Bouquet de la Grye has sought to apply these principles to the level of the Atlantic; and taking as zero the plane which passes through the Cape Verde Islands, under the tropic of Cancer, is found a depression of two metres; while near the United States there is a considerable surelevation, in some cases exceeding four metres. Thus making a difference of level of six metres between two points of the same ocean.

Charles Stokes, L.D.S.I., has been appointed Hon. Dental Surgeon to the Sheffield and South Yorkshire Ear and Throat Hospital.

Communications.

Communications have been received from Chas. Stokes, Sheffield; George J. Lucas, Gravesend; John S. Amoore, Edinburgh; T. F. K. Underwood, London; W. Bowman Macleod, Edinburgh; The Editor, *British Journal of Dental Science;* Edwin Saunders, London; F. J. Van Der Pant, Kingston; Charters White, London; Henry B. Mason, Exeter; House Surgeon of Dental Hospital of London and of National Dental Hospital.

Books, &c., Received.

"Dental Cosmos;" "Southern Dental Journal;" "Ohio State Dental Journal;" "Dental Register;" "Items of Interest;" "British Journal of Dental Science;" "Journal of British Dental Association;" "Presentation of Testimonial to Capt. W. J. Newman;" "Revue Odontologique;" "L'Odontologie;" "Le Progrès Dentaire;" "El Progreso Dental;" "Zahntechnische Reform;" "Chemist and Druggist;" "Medical Record."

THE

DENTAL RECORD.

VOL. II. SEPTEMBER 1, 1882. No. 9.

Educational Section.

SUGGESTIONS TO STUDENTS.

BEFORE commencing his Professional Education, the Dental Student must pass a Preliminary Examination in Arts. The examination most to be recommended is the matriculation of the University of London. Passing that examination will enable the student subsequently to present himself for an University degree, should he desire to do so. A list of the several examinations recognised by the General Medical Council as fulfilling the conditions required by that body regarding Preliminary Education, is to be found on page 387.

Any one who commenced his professional education before the 22nd July, 1878, is exempt from the Preliminary Examination.

After passing a Preliminary Examination, the student must receive at least three years' instruction in Mechanical Dentistry under a registered Dentist. It should be distinctly understood that the Royal College of Surgeons of England considers those three years of instruction, whether in the form of serving articles, or apprenticeship to Mechanical Dentistry, or otherwise, as Professional Education; therefore, they follow the Preliminary Examination.

The Medical Council has recently made the following recommendations to the several Medical Boards that grant Dental degrees, namely:—

> That one year's *bonâ fide* apprenticeship with a registered Dental Practitioner, after being registered as a Dental Student, may be counted as one of the four years of professional study.
>
> Also, That the three years of instruction in Mechanical Dentistry, or any part of them, may be taken by the Dental Student either before or after his registration as a student; but no year of such mechanical instruction shall be counted as one of the four years of professional study unless taken after registration.

As yet, only the Faculty of Glasgow has incorporated these recommendations in its regulations.

Having received a certificate of his Preliminary Examination, and commenced his Professional Education, either by apprenticeship or by hospital studies, it is necessary to register the same at the Medical Council Office, 299, Oxford Street, London, W. This must be done within fifteen days from the commencement of the pupil's professional studies. The beginning of such studies will not be recognised by any of the qualifying bodies as dating earlier than fifteen days before the time of registration.

Any one registered as a Medical student must also register as a Dental student, if he be such.

Having served his articles, the student may enter a General or a Dental Hospital, or both, and complete the Curriculum of at least four years of study from the date of registration; after which he is eligible to be admitted to examination for the Dental License.

Though the possession of the License in Dental Surgery is necessary for a name to be entered on the *Dentists' Register*, the student is strongly recommended to obtain some additional qualification in either Medicine or Surgery. On the other hand, though a Medical or a Surgical, other than the special Dental, qualification entitles its possessor to practise Dentistry, yet the course of study for such does not include any Dental instruction. Therefore, to be a Dentist, requires a more or less complete compliance with the Dental Curriculum.

It will be observed that the Curricula of the several Licensing Bodies differ somewhat from one another. The Curriculum of the Royal College of Surgeons of England exceeds the course of study recommended by the Medical Council by prescribing attendance upon a second course of lectures on Dental Anatomy, Dental Surgery, and Dental Mechanics. The Royal College of Surgeons of Edinburgh, and the Faculty of Physicians and Surgeons of Glasgow, require only six, instead of not less than twelve, months' attendance at a recognised General Hospital, with clinical instruction. The Curriculum of the Royal College of Surgeons in Ireland does not include a course of lectures on Anatomy of the Head and Neck, or a second course of Anatomy; nor a special course of lectures on Physiology; a course of lectures on Medicine; nor lectures on Dental Anatomy; and it only requires nine months', instead of two years', Dental Hospital Practice.

PRELIMINARY EDUCATION.

REGULATIONS OF GENERAL MEDICAL COUNCIL.

No person shall be allowed to be registered as a Medical or Dental Student unless he shall have previously passed a Preliminary Examination in the subjects of General Education as specified in the following list*:—

1. English Language, including Grammar and Composition.†
2. English History.
3. Modern Geography.
4. Latin, including Translation from the original, and Grammar.
5. Elements of Mathematics, comprising (*a*) Arithmethic, including Vulgar and Decimal Fractions; (*b*) Algebra, including Simple Equations; (*c*) Geometry, including the first two books of Euclid, or the subjects thereof.
6. Elementary Mechanics of Solids and Fluids, comprising the Elements of Statics, Dynamics, and Hydrostatics.‡
7. One of the following Optional subjects:—
   (*a*) Greek; (*b*) French; (*c*) German; (*d*) Italian; (*e*) any other Modern Language; (*f*) Logic; (*g*) Botany; (*h*) Elementary Chemistry.

List of Examining Bodies whose Examinations fulfil the conditions of the Medical Council as regards preliminary education:—

I. UNIVERSITIES IN THE UNITED KINGDOM.

UNIVERSITY OF OXFORD:—

1. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects:—
   Greek, French, German, Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.

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* The Examinations in General Education conducted by Universities will be accepted as heretofore, but if in any of these Examinations the subjects of Elementary Mechanics of Solids and Fluids are not included, the Candidate must pass in one or other of the remaining optional subjects instead, and a knowledge of Elementary Mechanics will be required at a subsequent Examination.

† "The General Medical Council will not consider any Examination in English Language sufficient that does not fully test the ability of the Candidate:—(1) To write sentences in correct English on a given theme, attention being paid to spelling and punctuation as well as to composition;—(2) to write correctly from dictation;—(3) to explain the grammatical construction of sentences;—(4) to point out the grammatical errors in sentences ungrammatically composed, and to explain their nature; and (5) to give the derivation and definition of English words in common use."

‡ "This subject may be passed either as Preliminary, or before, or at the first Professional Examination."

2. Senior Local Examinations; Certificate to include Latin and Mathematics.
3. Responsions.
4. Moderations.
5. Examination for a Degree in Arts.

UNIVERSITY OF CAMBRIDGE:—

6. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects:—
    Greek, French, German, Natural Philosophy, including the Elements of Statics and Hydrostatics.
7. Senior Local Examinations; Certificate to include Latin and Mathematics.
8. Higher Local Examinations.
9. Previous Examination.
10. Examination for a Degree in Arts.

UNIVERSITY OF DURHAM:—

11. Junior Local Examinations; Certificate to include Latin and Mathematics, and also one of the following optional subjects:—
    Greek, French, German, Natural Philosophy, including Mechanics, Hydrostatics, and Pneumatics.
12. Senior Local Examinations; Certificate to include Latin and Mathematics.
13. Registration Examination for Medical Students.
14. Examination for Students at the end of their first year.
15. Examination for a Degree in Arts.

UNIVERSITY OF LONDON:—

16. Matriculation Examination.
17. Preliminary Scientific (M.B.) Examination.
18. Examination for a Degree in Arts or Science.

UNIVERSITY OF EDINBURGH:—

19. Local Examinations (Junior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—
    Greek, French, German, Natural Philosophy.
20. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects:—
    Greek, French, German, Natural Philosophy.
21. Preliminary Examination for Graduation in Science or Medicine and Surgery.
22. Examination for a Degree in Arts.

UNIVERSITY OF ABERDEEN :—

23. Local Examinations (Honours Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
    Greek, French, German, Natural Philosophy.
24. Preliminary Examination for Graduation in Medicine or Surgery.
25. Examination for a Degree in Arts.

UNIVERSITY OF GLASGOW :—

26. Local Examinations (Senior Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
    Greek, French, German, Natural Philosophy.
27. Preliminary Examination for Graduation in Medicine or Surgery.
28. Examination for a Degree in Arts.

UNIVERSITY OF ST. ANDREW'S :—

29. Local Examinations (Honours Certificate); Certificate to include English Literature, Arithmetic, Algebra, Geometry, Latin, and also one of the following optional subjects :—
    Greek, French, German, Natural Philosophy.
30. Preliminary Examination for Graduation in Medicine or Surgery.
31. Examination for a Degree in Arts.

UNIVERSITY OF DUBLIN :—

32. Public Entrance Examination.
33. Examination for a Degree in Arts.

QUEEN'S UNIVERSITY IN IRELAND :—

34. Local Examinations for Men and Women; Certificate to include all the subjects required by the General Medical Council.
35. Entrance or Matriculation Examination.
36. Previous Examination for B.A. Degree.
37. Examination for a Degree in Arts.

OXFORD AND CAMBRIDGE SCHOOLS' EXAMINATION BOARD :—

38. *Certificate, to include the following subjects :—

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* The *English* is provided for by the following *Resolution*, passed by the Executive Committee on October 27, 1876 (*Minutes*, Vol. XIII., p. 357):—

"That as every Candidate for the Certificate of the Oxford and Cambridge Schools' Examination Board is required to answer questions in such a manner as to satisfy the Examiners that he has an adequate knowledge of English Grammar and Orthography, this shall be held as conforming to the requirements of the Medical Council in reference to English Language."

(*a*) Arithmetic, including Vulgar and Decimal Fractions.
(*b*) Algebra, including Simple Equations.
(*c*) Geometry, including the first two books of Euclid.
(*d*) Latin, including Translation and Grammar.
(*e*) Also one of these optional subjects :—
  Greek, French, German, Mechanical Division of Natural Philosophy.

II.—OTHER BODIES NAMED IN SCHEDULE (A) TO THE "MEDICAL ACT."

APOTHECARIES' SOCIETY OF LONDON :—

39. Examination in Arts.

ROYAL COLLEGES OF PHYSICIANS AND SURGEONS OF EDINBURGH :—

40. Preliminary (combined) Examination in General Education,

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW :—

41. Preliminary Examination in General Education.

ROYAL COLLEGE OF SURGEONS IN IRELAND :—

42. Preliminary Examination ; Certificate to include Mathematics.

APOTHECARIES' HALL OF IRELAND :—

43. Preliminary Examination in General Education.

III.—EXAMINING BODIES, IN THE UNITED KINGDOM, NOT INCLUDED IN SCHEDULE (A) TO THE "MEDICAL ACT" (1858).

COLLEGE OF PRECEPTORS :—

44. Examination for a First Class Certificate, or Second Class Certificate of First or Second Division, Algebra, Geometry, Latin, and a Modern Language, having been taken.

EXAMINERS FOR COMMISSIONS AND APPOINTMENTS IN HER MAJESTY'S SERVICE, MILITARY, NAVAL, AND CIVIL.

45. Certificate to include all the subjects required.

IV.—CERTAIN EXAMINATIONS OF INDIAN, COLONIAL, AND FOREIGN UNIVERSITIES AND COLLEGES.

REGULATIONS OF THE VARIOUS EXAMINING BODIES FOR THE DIPLOMA IN DENTAL SURGERY.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Candidates are required to produce the following Certificates :—

1. Of being twenty-one years of age.
2. Of having been engaged during four years in the acquirement of professional knowledge.

3. Of having attended, at a school or schools recognised by this College, not less than one of each of the following courses of lectures, delivered by lecturers recognised by this College, namely: Anatomy, Physiology, Surgery, Medicine, Chemistry, and Materia Medica.
4. Of having attended a second winter course of lectures on Anatomy, or a course of not less than twenty lectures on the Anatomy of the Head and Neck, delivered by lecturers recognised by this College.
5. Of having performed dissections at a recognised school during not less than nine months.
6. Of having completed a course of chemical manipulation, under the superintendence of a teacher or lecturer recognised by this College.
7. Of having attended, at a recognised hospital or hospitals in the United Kingdom, the practice of Surgery and clinical lectures on Surgery during two winter sessions.
8. Of having attended, at a recognised school, two courses of lectures upon each of the following subjects, namely:—Dental Anatomy and Physiology (Human and Comparative), Dental Surgery, Dental Mechanics, and one course of lectures on Metallurgy, by lecturers recognised by this College.
9. Of having been engaged during a period of not less than three years, in acquiring a practical familiarity with the details of mechanical dentistry, under the instruction of a competent practitioner. In the cases of qualified surgeons, evidence of a period of not less than two, instead of three years, of such instruction will be sufficient.
10. Of having attended at a recognised Dental Hospital, or in the Dental Department of a recognised General Hospital, the practice of Dental Surgery during the period of two years.

NOTE.—All Candidates who shall commence their professional education on or after the 22nd July, 1878, will, in addition to the certificates enumerated in the foregoing clauses, be required to produce a certificate of having, prior to such commencement, passed the preliminary examination in general knowledge for the diploma of Member of the College, or an examination recognised as equivalent to that examination.

Candidates who were in practice as Dentists, or who had commenced their education as Dentists prior to September, 1859—the date of the Charter—and who are unable to produce the certificates required by the foregoing Regulations, shall furnish the Board of Examiners with a Certificate of Moral and Professional Character, signed by two Members of this College.*

Together with answers to the following inquiries :—

Name Age Professional Address.

If in practice as a Dentist, the date of the commencement thereof.

Whether Member or Licentiate of any College of Physicians or Surgeons of the United Kingdom ; and if so, of what College.

Whether Graduate of any University in the United Kingdom ; and if so, of what University; and whether Graduate in Arts or Medicine.

The date or dates of any such Diploma, License, or Degree.

Whether Member of any Learned or Scientific Society; and, if so, of what.

Whether his practice as a Dentist is carried on in connection with any other business ; and, if so, with what business.

Whether, since 22nd July, 1876, he has employed Advertisements or Public Notices of any kind in connection with the practice of his Profession.

The particulars of Professional Education, Medical or Special.

The Board of Examiners will determine whether the evidence of character and education produced by a Candidate be such as to entitle him to Examination.

PROFESSIONAL EXAMINATIONS.

The examination is written, oral, and practical.

The written examination comprises General Anatomy and Physiology, and General Pathology and Surgery, with especial reference to the practice of the Dental Profession.

The oral and practical examinations comprise the several subjects included in the curriculum of professional education, and is conducted by the use of preparations, casts, drawings, and by operations, etc.

Members of the College, in the written examination, will only have to answer those questions set by the Section of the Board consisting of persons skilled in Dental Surgery; and in the oral and practical examinations will be examined only by that Section.

A Candidate whose qualifications shall be found insufficient will be referred back to his studies, and will not be admitted to re-examination within the period of six months, unless the Board shall otherwise determine.

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* N.B.—In the case of Candidates in practice, or educated in Scotland or Ireland, he Certificate of Moral and Professional Character may be signed by two Licentiates of the Royal College of Surgeons of Edinburgh, or the Faculty of Physicians and Surgeons of Glasgow, or of the Royal College of Surgeons in Ireland, as the case may be.

Examinations will be held in January and June.

The Fee for the Diploma is Ten Guineas, over and above any stamp duty.

NOTE.—A ticket of admission to the Museum, to the Library, and to the College Lectures, will be presented to each Candidate on his obtaining the Diploma.

SYLLABUS OF EXAMINATIONS.

In addition to the Special Examination by the Dental Section of the Board of Examiners, Candidates are expected to answer questions in the written and *vivâ voce* Examinations on the following subjects:—

ANATOMY AND PHYSIOLOGY.

The names of the Bones, and of their more important parts and their articulations.

The names and position of the principal Arteries, Veins, and Nerves.

The form and relations of the Viscera of the Head, Chest, and Abdomen, and an elementary knowledge of their structure.

An elementary knowledge of the structure and properties of the principal tissues.

An elementary knowledge of the functions of digestion, Absorption, Circulation, Respiration, Secretion, Motion, and Sensation.

The Surgical Anatomy and Physiology of the Organs of Mastication, Deglutition, Taste, and Articulation.

PATHOLOGY AND SURGERY.

Inflammation and its consequences.

The healing of Wounds.

The methods of arresting Hæmorrhage.

The union of Fractures.

The signs of Asphyxia, and the treatment of threatened death from Anæsthetics.

The injuries and diseases of the Jaws, Mouth, Fauces, and adjacent parts.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

PRELIMINARY EXAMINATION.

Candidates for the Dental Diploma must produce evidence of having attained the age of twenty-one years, and will require to produce a Certificate of having passed the Preliminary Examination in General Education required for the ordinary License in Surgery, or an examination equivalent to this, and recognised by the General Medical Council,—except in the case of Candidates who shall have commenced their professional education previous to the first day of August, 1878.

PROFESSIONAL EXAMINATION.

Candidates will also be required to produce Certificates of having been engaged during four years in the acquirement of professional knowledge, and of having been during that period, or at some time previous to their examination, engaged for not less than three years in the acquirement of a practical knowledge of Mechanical Dentistry with a practitioner registered under this Act.

LECTURES AND HOSPITAL ATTENDANCE.

The following Lectures and other Courses of Instruction must have been attended by Candidates for the Dental Diploma, at a recognised Medical School or Schools; and the number of Lectures in each of the general courses must correspond with those required for the Surgical Diploma of the College:—

Anatomy	One Winter Course.
Dissection and Demonstrations, or Dissection	Nine Months.
and	
Anatomy of Head and Neck	One Course of Twenty Lectures.
Physiology	One Course of not less than Fifty Lectures.
Chemistry	One Winter Course.
Surgery	One Winter Course.
Medicine	One Winter Course.
Materia Medica	One Course of Three Months.
Practical Chemistry and Metallurgy	One Course of Three Months.
Clinical Instruction in Surgery at a recognised Hospital	One Course of Six Months, or Two Courses of Three Months.

In addition to these, Candidates will require to have attended the following Special Courses of Lectures and Instruction, in terms of the Curriculum, and by teachers recognised by this College:—

Dental Anatomy and Physiology	One Course of each.
Dental Surgery and Pathology	
Dental Mechanics	

Two Years' Attendance at a Dental Hospital, or the Dental Department of a General Hospital, recognised by the College.

Candidates who are Licentiates of this College, or who may be registered Medical Practitioners, will require to produce Certificates of Attendance on the special subjects only, and will be examined in these only for the Dental Diploma.

EXAMINATIONS.

The Dental Examinations shall be both written and oral, and be conducted in the same manner as the ordinary Surgical Examinations. The Examinations shall consist of two separate sittings, and be held subsequent to each period of the Ordinary Examinations, on such days as the College may appoint. Candidates must apply to the Secretary of the College on or before the Saturday preceding the Ordinary Examinations, and must then produce all the required Certificates of having passed the Preliminary Examination, and of having attended the Lectures and other prescribed courses of instruction.

SUBJECTS OF EXAMINATION.

The ordinary subjects of Examination will be Anatomy, Physiology, Chemistry (including Metallurgy), Surgery, Medicine, and Materia Medica; and the special subjects will be Dental Anatomy and Physiology, Dental Surgery and Pathology, and Dental Mechanics. Anatomy, Chemistry (with Metallurgy), and Physiology, will form the subjects of the first Examination; Surgery, Medicine, Materia Medica, and the special subjects, those of the second.

TITLE AND DIPLOMA.

Those Candidates who pass this Examination shall be entitled to the designation of Licentiate in Dental Surgery of the Royal College of Surgeons of Edinburgh, and shall obtain the Dental Diploma of the Royal College. Each Candidate, before receiving his Diploma shall, in entering his name in the books of the College, sign the following declaration :—

> I hereby promise faithfully to maintain and defend all the rights and privileges of the Royal College of Surgeons of Edinburgh, and to promote its interests to the utmost of my power. I promise, in the event of my admission as a Dental Licentiate of that College, to refrain from advertising or employing any other unbecoming modes of attracting business, and I shall not allow my name to appear in connection with any one who does so. I also promise to obey all the laws of the said Royal College, made or to be made.

FEES, ETC.

The fee for the Dental Diploma shall be ten guineas. Each Candidate, for the first examination, shall pay to the Secretary of the College the sum of four guineas not later than nine a.m. of the Saturday preceding the ordinary examinations; and in the event of a Candidate being unsuccessful two guineas will be returned to him. Where the Candidate is successful the sum of four guineas will be considered as paid to account of the Diploma. Each Candidate for the second examination shall pay to the Secretary of the College the sum of six guineas not later than nine a.m. of the Tuesday preceding the second examination; and in the event of his being unsuccessful three guineas will be returned to him. No Candidate will, if unsuccessful, be remitted for a shorter period than three months. These Rules will apply to any subsequent rejection.

EXAMINATIONS SINE CURRICULO.

Candidates who were in practice before the first day of August, 1878, or those not in practice but who had commenced their apprenticeship as Dentists before the first day of August, 1875, and who are unable to furnish the Board of Examiners with the certificates of lectures and hospital attendance required by the foregoing regulations, shall fill in the schedule of application as follows:—

1. Full name, age, and address of Candidate.
2. Certificate of moral and professional character, signed by two registered medical practitioners.
3. The date of commencing practice or apprenticeship as a Dentist, and whether, if in practice, such practice has been carried on in conjunction with any other business, and if so, with what business.
4. Whether he has any degree or diploma in medicine or surgery, and if so, from what college or university, or other body, and at what time it was obtained.
5. The particulars of professional education.

The President's Council shall, on such information being afforded them, determine whether or not the Candidate may be admitted to examination for the Dental Diploma, and such examination shall, with the exception of the preliminary examination, and the exemptions in favour of Registered Medical Practitioners, as before explained, be passed on the same subjects and in the same manner as is required for other Candidates, and will confer the same privileges.

The following will be the periods of examination for the year 1882-83:—

I. PRELIMINARY EXAMINATIONS IN GENERAL EDUCATION.

On Saturday, Monday, and Tuesday, October 14th, 16th, and 17th, 1882.

On Tuesday, Wednesday, and Thursday, April 10th, 11th, and 12th, 1883.

On Friday, Saturday, and Monday, July 6th, 7th, and 9th, 1883.

II. FIRST PROFESSIONAL EXAMINATIONS.

On Tuesday, October 17th, 1882.
On Tuesday, January 23rd, 1883.
On Tuesday, March 27th, 1883.
On Tuesday, April 17th, 1883.
On Tuesday, July 17th, 1883.

III. SECOND PROFESSIONAL EXAMINATIONS.

These will take place after the conclusion of the first professional examinations, at each of the above-mentioned periods. They will generally be begun on the Thursday succeeding the day of the first examination, and in no case on an earlier day.

SYLLABUS OF EXAMINATIONS.

In addition to a particular acquaintance with Dental Anatomy, Physiology, and Surgery, Candidates are expected to possess a general knowledge of, at least, the following subjects of examination :—

ANATOMY AND PHYSIOLOGY.

1. The Skeleton in general; the anatomical characters and articulations of the Bones; with the Muscles of the Inferior Maxilla and Upper and Lower Extremities.
2. Names and positions of the principal Blood-vessels and Nerves, and of the Viscera of the Chest and Abdomen.
3. General Anatomy of the Brain and Intercranial Nerves.
4. General knowledge of the functions of Circulation, Respiration, and Sensation.
5. An elementary knowledge of Histological Structures.

CHEMISTRY.

1. The Laws of Combination.
2. Sources or preparation and chemical properties of Oxygen, Hydrogen, Nitrogen, Carbon, Sulphur, and Chlorine.
3. A general acquaintance with the Chemistry of Potass, Soda, Ammonia, Iron, Lead, Gold, Copper, Zinc, Arsenic, and Mercury.

MEDICINE, SURGERY, AND MATERIA MEDICA.

1. The nature and treatment of Inflammation, Hæmorrhage, Asphyxia, Syncope, Wounds, and Fractures; along with an Elementary knowledge of Diseases in general.
2. A general knowledge of the action of Narcotics, Emetics, Purgatives, Depressants, and Stimulants, with examples of the commoner substances used as each, and the modes of their prescription.

PROFESSIONAL EDUCATION REQUIRED BY THE FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

The regulations of the Faculty of Glasgow do not materially differ from those of the Royal College of Surgeons of Edinburgh; with the exception of the Faculty having adopted the recent recommendations of the Medical Council regarding instruction in Mechanical Dentistry and the Preliminary. (See page 385.)

The following are the periods of the Dental Examinations for 1882-83:—

First Examination.

Wednesday	11th October, 1882.
Tuesday	23rd January, 1883.
Monday	2nd April, 1883.
Monday	16th July, 1883.

The *Second Examination* will take place on the day following the First Examination.

PROFESSIONAL EDUCATION REQUIRED BY THE ROYAL COLLEGE OF SURGEONS IN IRELAND.

After the 1st day of August, 1881 (?), no Candidate shall be admitted to Examination who has not pursued the following curriculum, and lodged with the Registrar of the College, at least a fortnight previous to Examination:—

1. A Certificate of having attained the age of twenty-one years.
2. A Certificate of having been engaged during four years in the acquirement of professional knowledge.
3. Certificates from two Fellows or Licentiates of any College of Surgeons in the United Kingdom, and from two Licentiates in Dental Surgery of the Royal College of Surgeons in Ireland, or two Members of the British Dental Association, or of the Odontological Society, or of the Association of Surgeons practising Dentistry, testifying that the Candidate is of good character.
4. A Certificate of having passed the Examination in Preliminary Education of one of the Examining Bodies recognised by the General Medical Council.
5. A Certificate of having lodged in the Bank of Ireland, to the credit of the College, the Fee of Ten Guineas, half of which shall be returned to any Candidate who fails to satisfy the Examiners; and no Candidate can present himself for re-examination for six months.
6. Certificates of having attended in a recognised school—
    One Course of Lectures on Anatomy and Physiology.
    Two Courses of Dissections, with Demonstrations.
    One Course of Lectures of Surgery.
    One Course of Lectures on Chemistry.
    One Course of Practical Chemistry and Metallurgy.
    One Course of Lectures on Materia Medica, and
    Two Courses of Lectures on Dental Surgery, including Dental Mechanics.

7. Certificates of having attended General Hospital Practice for Two Winter Sessions; and the Dental Department of a General Hospital, or a Special Dental Hospital, for a further period of nine months.
8. A Certificate of having been engaged during, at least, three years in acquiring a practical knowledge of Dentistry, under the instruction of a Registered Licentiate in Dentistry of one of the Licensing Bodies.

The Examinations shall include all the subjects of the foregoing curriculum, and shall be partly Written and partly Oral, preparations, microscopes, and other appliances being used.

Licentiates in Surgery, or Fellows of any College in the United Kingdom, and Graduates in Surgery of any University recognised by this College, will be examined only in subjects special in Dentistry.

N.B.—Every successful Candidate, previous to receiving the License, shall declare that he will not advertise, or pursue any other unbecoming mode of attracting business, so long as he holds the License in Dentistry of the College.

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By Chas. S. Tomes, M.A., F.R.S., &c.—On Wednesdays and Fridays, at 8 a.m., during the Summer Session.

DENTAL SURGERY AND PATHOLOGY.

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By Willoughby Weiss, L.D.S.Eng.—On Tuesdays and Thursdays, at 6 p.m., during May, June, and July.

DENTAL MECHANICS.

By Harry Rose, L.D.S.Eng.—On Mondays, at 7 p.m., during January, February, and March.

DENTAL METALLURGY.

By Alfred Tribe, F.I.C., F.C.S.—On Tuesdays, at 9 a.m., during January, February, and March.

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QUEEN'S COLLEGE, BIRMINGHAM, AND BIRMINGHAM DENTAL HOSPITAL.

The teaching of Dentistry is now undertaken by the Queen's College, acting in association with the Birmingham Dental Hospital and the Birmingham Clinical Board, so that Students may fully qualify themselves for the Dental diploma of the Royal Colleges.

The Dental Hospital is centrally situated, near the College, and is open daily (Sundays excepted). The number of patients treated in 1881 was 7,000.

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DENTAL SURGERY AND PATHOLOGY.

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DENTAL MECHANICS.

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DENTAL MECHANICS.

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Attendance on the practice of this Hospital is recognised by the Royal College of Surgeons of England as qualifying for their Dental Diploma. Pupils of any member of the staff, or other Registered Practitioner (being a Life or Annual Governor), are permitted to attend the practice of the Hospital, subject to the approval of the Medical Sub-Committee, on payment of Five Guineas annually to the funds of the Institution.

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Fees for Hospital Practice.—Five Guineas per annum to Students of the Liverpool Royal Infirmary School of Medicine, and pupils or apprentices of registered Dentists. Pupils and apprentices of the Honorary Dental Surgeons shall have the privilege of attending the practice of the Hospital free of expense.

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DENTAL ANATOMY AND PHYSIOLOGY.

By Andrew Wilson, L.D.S.Edin. — On Tuesdays and Fridays, at 8 p.m., commencing November 7th.

DENTAL SURGERY AND PATHOLOGY.

By George W. Watson, L.D.S.Edin.—On Tuesdays and Fridays, at 8 p.m., commencing May 3rd, 1883.

MECHANICAL DENTISTRY.

By W. Bowman Macleod, L.D.S.Edin.—On Wednesdays, at 8 p.m., commencing November 8th.

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W. Bowman Macleod, Dean.

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By David Taylor, M.B., L.D.S.Glas.—On Wednesdays and Fridays, at 8 a.m., during Summer Session.

DENTAL SURGERY AND PATHOLOGY.

By J. R. Brownlie, L.D.S.Eng.—On Tuesdays and Thursdays, at 8 a.m., during Summer Session.

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Fee for two years' Hospital Practice is £10 10*s*.; for the Dental Lectures £2 2*s*. each. For the general portion of the Curriculum, £18 18*s*.; for the entire Curriculum, £35 14*s*.

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The Fee for Dental Practice is £3 3*s*. for one Session, and £5 5*s*. for two Sessions.

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The Composition Fee for Dental Students is £42 2*s*.

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Fee for attendance on the Hospital Practice and Lectures required for the Dental Diploma of the College of Surgeons, 63 guineas, or in two annual instalments of 40 guineas and 23 guineas. The above fee does not include £1 10*s*. for Practical Chemistry.

Dr. F. TAYLOR, Dean.

KING'S COLLEGE, STRAND, W.C.

No special arrangements are made for Dental Students.

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Composite Fee for Dental Students—Hospital Practice and Lectures, £42. This does not include the fee of £2 2*s*. for Practical Chemistry.

MUNROE SCOTT, Warden.

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Students who intend to become Licentiates in Dental Surgery of the Royal College of Surgeons are admitted to attend the requisite Courses of Lectures and Hospital Practice on payment of a fee of 40 guineas, in one sum on entrance, or by instalments of £30 on entrance, and £15 at the beginning of the second Winter Session.

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Fee for General Subjects required for the Diploma in Dental Surgery, including Practical Chemistry, £55; payable in two instalments,—first year, £30; second year, £25. Dr. WADHAM, Dean.

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Entrance Fee to the Hospital Practice and Lectures required for the examination in Dental Surgery at the Royal College of Surgeons, England, £55. This sum may be paid by instalments of £30, and £25.

A. B. **Shepherd**, M.D.

ST. THOMAS'S HOSPITAL, ALBERT EMBANKMENT, S.E.

The Fee for attendance on the *general* subjects required of Students in Dental Surgery, is for the two years £55; or by instalments, £50 for the first year, and £10 for the second year.

Dr. **Gillespie**, Secretary.

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No special arrangements are made for Dental Students.

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The Fees for the (general) requirements of Dental Students, according to the Curriculum of the Royal College of Surgeons of Edinburgh, amount to £38 10*s*.

Stevenson Macadam, Secretary.

ANDERSON'S COLLEGE, GLASGOW

The Fees for the requirements of Dental Students, as prescribed by the Curriculum of the Faculty of Physicians and Surgeons of Glasgow, amount to £18 18*s*. And the Fees for the Special Dental portion of the Curriculum, including £10 10*s*. for Dental Hospital Practice, are £16 16*s*.—Total, £35 14*s*.

Dr. A. M. Buchanan, Dean.

BOOK REVIEW.

A Manual of Dental Anatomy. By Charles S. Tomes, M.A., F.R.S., &c. Second Edition. London: J. & A. Churchill.

(*Concluded from page* 351.)

In the chapter on the Attachment of Teeth, several most interesting additions have been introduced. The fixation of teeth merely by a fibrous membrane is first mentioned and described; and then other less simple forms of attachment are set forth and explained, and how in different families of fish by a series of modifications, the highly specialized hinged teeth are obtained. In the angler fish (*Lophius*) a simple hinged tooth is met with, the elasticity of the hinge residing solely in the ligamentous band with which the tooth is secured by its inner inferior border to the bone. In the hake (*Merlucius*) the efficacy of this arrangement is further advanced. The outer part of the tooth rests upon a raised and rounded buttress of bone, so that when the tooth, after being flexed, is suddenly returned to the erect position, it is better able to stand the shock, and less liable to be fractured or lost. In the pike the teeth are hinged also, but the resiliancy with which they return to the erect position after having been pressed down is increased by the tension of a number of rods of partially calcified bone which, so to speak, tie the tooth down; indeed, so elastic are they that when it is bent over, and suddenly released, the tooth returns to its original position with an audible snap, while on the other hand if the rods are severed by a fine instrument, without damage to the hinge, the spring is entirely lost and the teeth will remain in any position in which they are placed. Figures of sections of these two latter types of hinged teeth are given, which render the account far clearer than any lengthened description could do. From the study of these modifications of the simple fibrous attachment the author draws the following general deductions:—(i.) That hinged teeth have arisen independently in three families of fish widely removed from one another; and (ii.) that whilst the general object of mobility and elastic resiliancy is attained in all, it is by a different mechanism, and by the least modification possible of the existing fixed teeth of the family.

The position of these teeth in the pike, as detailed in the next chapter, is very interesting. Great numbers of them are arranged in three rows or bands upon the roof of the mouth, and the points of all of them are seen to converge towards the throat. The pike, well known to be a very voracious creature, preys in great measure upon smaller fish, which it usually seizes transversely—across the mouth. Whilst in such a position it is obvious that the fish, for instance, a good-sized roach, cannot be swallowed, and it is now that the hinged teeth on the palate come into play in assisting to turn the roach from a transverse to a longitudinal position. Every motion, brought about either by the movements of the jaws of the pike or by the struggles of the unfortunate fish itself, is taken advantage of by these teeth, and tends to place the captive aright, and readily allows, indeed aids, its passage towards the gullet, while the teeth at the same time effectually bar any movement in the contrary direction.

In the description of the poison fang of the colubrine snakes, in the chapter on the Teeth of Reptiles (p. 248), there is a sentence which we venture to think would be better understood if worded differently. The text reads—"Their poison fangs are not very long, and they remain constantly erect, being anchylosed to the bone (the maxilla) which is long and not movable," etc. The natural conclusion which a student reading this for the first time would come to, would be that the fact of poison fangs of this particular snake remaining constantly erect was due to the anchylosis, and that in other snakes in which the teeth were movable they were not fixed to the bone in this manner. Such a meaning the author does not intend to convey, as he afterwards states clearly, when writing of the viperine snakes, that their teeth are also anchylosed, and that it is the maxilla that is movable. This chapter is closed with a short account of the teeth of some of the *Dinosauria* and *Pterosauria*. The latter are of great interest, as they seem to supply a connecting link between reptiles and birds. The Pterodactyls were some of them of considerable size, and possessed wings very like those of a bat which, in some species, measured as much as twenty feet from tip to tip. Their jaws were furnished in their entire length with long, slender, sharp teeth, but in *Ramphorhynchus* the anterior extremity of the jaws were without teeth, and it has been conjectured that these positions were sheathed in horny beaks. There existed also a species of *Pterodactylus* which has been named *Pteranodon*, from the fact that their jaws did not possess teeth, the premaxillaries seem to have been encased in a horny covering; in fact, they rather resembled the jaws of birds than those of reptiles. In the *Odontotornæ*, an order of extinct birds, a certain genus *Ichthyornis* possessed very similar Dental armatures to some of the *Pterosauria* (extinct reptiles). There were about twenty-one teeth in each ramus, all sharp, pointed, and recurved. "They are implanted in distinct though shallow sockets, and the maxillary teeth are a little larger than those opposing them; the premaxillaries were probably edentulous, and perhaps covered with a horny bill." Of the teeth of *Hesperornis*, another large extinct bird, Prof. Marsh observes:—"In all their main characteristics the teeth of *Hesperornis* are essentially reptilian, and no anatomist would hesitate to refer them to that class had they been found alone. Combined with the other reptilian characters of *Hesperornis* . . . . they clearly indicate a genetic connection with that group."

No one can compare the accounts of the dentition of these extinct genera without being struck with their great similarity, and if the probabilities mentioned above should ever be proved to be certainties, another strong connecting link will have been forged, helping to unite the two great classes of Reptiles and Birds.

Passing on to the "Teeth of Mammals" we notice one or two slight discrepancies which existed in the former edition, and have remained unaltered in this. At the bottom of page 283 the Lemurs are spoken of as possessing eight procumbent teeth, while on page 403, where the Lemurs are more particularly described only six are mentioned. The number varies in different species. Also on page 288 the Dentine in the central axis of the teeth of the sloth is given as an example of Osteo-dentine, while a little farther on, at the foot of page 306, it is stated to consist of Vaso-dentine. Mr. Tomes has added an item of additional interest with regard to the fœtal teeth of one of the Whalebone Whales (*Balænoptera rostrata*), which has important bearings regarding the history of the evolution of the cetaceans; and we much regret that want of space forbids our noticing it here.

At the commencement of the article upon the teeth of the Artiodactyle Ungulates there is a paragraph which we somewhat expected to have seen altered, as from the explanatory parenthesis and the bracketing contained in it, it is involved, and in some measure difficult to grasp. It reads thus:—"The Ruminants are divided into three groups: (i.) The Tragulidæ (small deer of Southern Asia), which form a connecting link between the Anplotherium (itself a link between the Pigs and the true Ruminants) and the Pecora; (ii.) Pecora (sheep, oxen, &c.); (iii.) Camelidæ." By the time that the reader has arrived at the end of the explanation concerning the *Traguildæ*, and understands the position of the *Anplotherium*, he will probably have lost the gist of the paragraph, and will have to refer to its opening sentence. There is a remark we should also like to make regarding the Dental formulæ of some of the mammalia, at the same time bearing in mind the great difficulty to be experienced in attempting to classify all teeth under a definite nomenclature. The pig, in the Dental formulæ given, is represented as possessing three premolars ($\frac{3}{3}$), while in the illustration four ($\frac{4}{4}$) are figured. This latter condition is accounted for thus: "the first (deciduous molar) remains in place till the permanent dentition is complete, and then falls out without having any successor." Therefore, it may be regarded either as a deciduous molar, or as a permanent tooth which has no predecessor. How is it that three premolars are ascribed to the pig, while in other animals, as for instance, in the hippopotamus (p. 331), or in the dog (p. 378), where a similar condition of things exists, the formula is written p.m. $\frac{4}{4}$? Truly the tooth remains longer in place in the dog, but that seems to us scarcely a point at which the line can be drawn. At the close of the chapter upon the *Ungulata* we find some additional articles upon certain extinct orders of this large group of animals; they are almost entirely fresh to this edition, and embody the results of some of the discoveries of Prof. Marsh in the Eocene formations of Wyoming.

The chapter relating to the teeth of the *Carnivora* is but little altered, the subject of which it treats being most admirably handled. The author shows how, within the range of a single order, a type of dentition bearing unmistakeable family characteristics may yet become in certain lines more highly specialized to suit the particular modes and habits of life of its possessors, as among the *Felidæ*, where the teeth are only adapted for flesh feeding; or among bears, where they are so modified as to suit the requirements of mixed or vegetable feeders. There is one place, however, where the wording is perhaps not quite so clearly put as it might be. When speaking of the dentition of the *Felidæ* (383), the text reads thus:—"The first upper (really the second of the typical mammalian dentition) premolar is almost a rudimentary tooth . . . the third is a well pronounced carnassial tooth." As the student has already read that the fourth upper premolar is the carnassial, this might tend to confuse, while some such reading as—the second upper premolar (the first being lost) . . . the fourth is a well pronounced carnassial tooth—would place the matter beyond mis-comprehension.

When writing on the teeth of the marsupials, the author states that the pro-cumbent lower incisors of the kangaroo grow from persistent pulps; probably Mr. Tomes's investigations into the subject have been wider than our own, but in those we have examined, the roots taper off and do not exhibit the appearances of teeth of persistent growth.

Before concluding this review we would congratulate the author most heartily upon the results of his revision and the deserved success with which his Manual has hitherto met. The book must have cost him years of patient study and research, to say nothing of the wide reading absolutely necessary to gain a full acquaintance with existing facts and the views upon doubtful points held by authorities high in literary position. As we have found it necessary in some places to notice slight mistakes or clerical errors, we trust we have in no way seemed to have been captious, for that has been far from our intention. Now that Mr. Tomes has opened so many fields for inquiry, it remains for all interested in these important questions to follow them up, elucidate doubtful points, and discover fresh facts in the great field of Odontology, that in the not distant future there shall be a greater mass of certainties from which the author, with less labour and still greater precision, may be able to draw his conclusions.

THE STRUCTURE OF THE TEETH OF THE PIKE.

By Dr. ALFRED STERNFELD.

Abstracted and translated from *Archiv für Mikrosk Anatomie*, Bd. 20.

(*Concluded from page* 355.)

DENTINE.

TRUE Dentine contrasts clearly with Vaso-dentine by the existence of the border, which the peripheral canals of the latter form through abundant anastomoses. This border is found in the shape of a series of round, oval, or large interstices seen in transverse sections, which always correspond with the cavity of a canal, or the junction of two canals. In longitudinal sections one meets with shorter or longer vascular fragments in uninterrupted succession, bordering between the Vaso-dentine and the true Dentine. Two essentially differing regions may be perceived in the latter; those situated near the axis generally show, in decalcified as well as hard preparations, a perfectly homogeneous ground substance, in longitudinal as well as in transverse sections. In several preparations made from teeth decalcified with picric acid are shown, by carmine particularly distinctly, also with hæmatoxylin, isolated clear fields; neither a fibrous stripe, nor a store of fibrous bundles, nor cellular structures, are to be seen in the ground substance. The ground substance of the sections of teeth after having been coloured with carmine or hæmatoxylin, and then decolorised with hydrochloric acid, appears colourless, or only very slightly coloured, showing distinct nuclear variations. By the use of picric acid the entire area of each Dentinal tube appears coloured, and the difference between the contents and the tube walls is nowhere to be seen. In the teeth decalcified by chromic acid the walls of the tubes mostly become strongly coloured, and very delicate fibres are to be found in them; these, through retraction, become so fine that they can only be seen through a strong magnifier. Although hydrochloric acid is always used along with the chromic acid, it cannot be the cause of the retraction; for notwithstanding the addition of hydrochloric acid to picric acid, when the latter is used in the preparation, there is, as a rule, no retraction. In the first place, fibres are found in longitudinal sections, tinted with carmine, of a not yet anchylosed nor fully developed tooth of the lower jaw; Dentine tubes with tree-like ramifications are here seen going from the canal in a longitudinal direction, and in the interior of the same, standing off from the wall, stronger-tinted fibres are seen, which follow the tubes to their finest ramifications. Having settled that these Dentinal tubes contain fibres, it must be presumed that they proceed from cells, and correspond with the odontoblasts in the teeth of mammalia. But which are the cells which furnish the fibres? At all events, those cells can only be situated in the more external vascular canals of the Vaso-dentine, and therefore the Dentine tubes containing fibres take their origin in these vascular canals. Are they endothelial cells of the canals, or cells which still lie outside the endothelium? My preparations decide in favour of the first question. In the longitudinal sections (from which the representation fig. 12 is taken) the trunks of the fibres are seen proceeding from flat cells which form a continuous lining to the Vaso-dentinal canal. These cells cannot be considered as odontoblasts, from their form, and from their covering in the vascular canals; but that similar cells originate from the odontoblastic cells of the teeth of mammalia appears very probable, because very varying palisado-shaped cylindrical cells, with distinct nuclei, are found in the base of the tooth of the young pike.

This well-marked odontoblastic layer does not seem to have been observed by Owen; and Heincke, as well as Tomes, dispute the presence of one. Heincke says he cannot find a well-marked odontoblastic layer in any part of the pike's tooth.

These cells gradually end in a point, in contradistinction to the afore-mentioned endothelial cells. The endothelium of the canal wall, already described as large flat cells with an out-jutting nucleus, appear, when seen from the surface, as large plates of varying form. After it was discovered that the fibres of the more external vascular canals extend from the endothelial cells to the Dentinal tubes, it was supposed that the primitive tubes of the Vaso-dentine received such fibres from the endothelium of the corresponding vascular canals. The jutting out of the fibres from the walls of the respective canals is as clearly to be observed here as in the primitive tubes of the Dentine. Isolated fibres follow each other much more remotely in the transverse than in the longitudinal sections, which circumstance gives a preponderance to the horizontal position of the primitive tubes. I have not been able to decide whether the branches of the neighbouring fibres hanging together here and there, correspond with the anastomosis of the primitive tubes itself, but it seems to be very probable. That which concerns the out-jutting point of the fibres in the primitive tubes of the Vaso-dentine will with great certainty be confirmed by their connection with the endothelial cells of the vascular canals.

It is evident by these discoveries that the substance of the axis of the pike's tooth exhibits a calcified fibrous tissue, through which canals exist on the plan of Haversian systems; this dispenses with the typical bone corpuscles, the tissue possessing, instead, a network of primitive tubes, which only in their arrangement differ from the primitive tubes of the Dentine. It borders more upon the true Dentine, as Tomes knew, and the disputed erroneous vascularity is justified by his describing the same as Vaso-dentine. The exterior region of the

Dentine differs from the inner in its structure. As already described above, the terminations of the tooth canals form an extremely delicate, calcified, very close network. The ground substance is only clearly discernible in the larger meshes, and here are found abundant, clear, finely dotted fields on the transverse sections as in Vaso-dentine, which undoubtedly represent the transverse section of fibrous bundles. Fibrous bundles are also observed in this place by Heincke, who says that the anastomosed canals which cross each other, frequently separate on transverse discs of calcified fibrous bundles. The outer Dentine layer is observable in the tinted sections by a deep colour, which probably arises from the abundance of the colouring matter in the canals, in comparison with the coloured contents of the same, and from the scantiness of faint unstained ground substance.

ENAMEL.

Born finds enamel on the teeth of fish, particularly that of the pike. Retzius finds enamel on the teeth of several fish, but denies the presence of it on the pike's tooth. Owen describes enamel as being only in a trifling minority on the teeth of fish. He appears to adopt Retzius' views relating to the pike's tooth, because he literally returns to his description of it. Leydig entirely denies the appearance of enamel on the teeth of fish. Waldeyer admits only a cuticle on the pike's teeth, and remarks besides that Kölliker's introduction of the term " cuticle of the enamel " for " cuticle," proves rightly that it is unsuitable for the pike's tooth, because here a cuticle and no enamel exists. Kölliker asserts that enamel does not exist in fish, from this circumstance, that the existence of prisms is not quite certain. According to Heincke all the teeth of the pike have genuine enamel; it is of a yellowish brown colour, and only covers the extreme apex of the tooth very sparingly, attains a considerable hardness, and is preserved throughout the whole life of the tooth. The exterior layer of enamel is fine structureless tissue, even at a distance from the apex of the tooth. As the Dentine of the pike's tooth is not, comparatively, very strong, yet the upper part of the tooth, because of its covering with hard enamel masses, attains a considerable resisting power. The enamel on the apex is neither firmly fixed upon the tooth, nor from its homogeneous or granular structure is it readily distinguished from the similar looking Dentine of the apex; and, secondly, it appears very evident, from microscopic examination, that the last off-shoots of the tooth canals advance nearly to the extreme apex of the tooth. Charles Tomes admits of enamel on the teeth of fish, and states that the greatest variety of structure is found in them. On the teeth of the lower jaw of a young pike I discovered a layer of large cylindrical cells in close contact with the surface. These cells cannot be any thing else but enamel-epithelium. On the border of the uncalcified root portion, as well as on the more advanced calcification of the apex of the tooth, the enamel cells rise successively, and the layer disappears. Towards the point, the enamel cells are seen reaching further than the cylindrical odontoblasts which recede towards the interior of the calcified tip. This discovery suffices to prove the existence of enamel, viz., that on the entire expansion of the crown of the tooth, on the exterior region of the Dentine, a fixed layer of palisado-shaped calcified elements is found, which may be interpreted as enamel-prisms. The only thing which at first sight could give rise to an objection is the fact that, by the injection of aniline blue, primitive tubes are brought out in the Dentine which extend between these prisms, if not on the entire surface. Out of the close network of these tubes, in the outer region of the Dentine, continuations arise, which pursue a parallel course, going perpendicularly to the surface of the tooth. Tomes states that there are canals, as well as prisms, in the enamel in the sargus; but it is not determined whether the canals have their course between the prisms or inside them. Tomes' statements concerning the teeth of marsupials is confirmed by Kölliker. The enamel prisms of the pike's tooth are not implanted in the Dentine by smooth-ended surfaces, but these interior endings of the enamel-prisms are either wedge-shaped, pyramidal, or, possibly also, conical. By this means the border of enamel on the Dentine becomes a saw-shaped cogged-line. At all events, the connection of the prism-layer with the surface of the Dentine, as between enamel and Dentine in the teeth of mammalia, appears to be a loose one. I have not been able to perceive variations in the enamel-prisms resembling transverse striæ covering the prisms; a completely homogeneous layer is found, which on the sides and apex of the tooth, where the prisms are shorter, is strongly developed and much more easily perceived. The Dentinal tubes do not advance to this layer. Heincke considers the outer homogeneous layer as enamel, and the inner portion of the prisms he ascribes to the Dentine; the latter, however, does not appear to me to be correct.

The enamel of the pike's tooth contains two layers—an inner one, consisting of enamel prisms, and an outer homogeneous one. The enamel prisms are continuously bound by this homogeneous layer.

ENAMEL CUTICLE.

A cuticle, as already mentioned by Waldeyer, is admitted on the pike's tooth; Heincke closely describes the same, and I can confirm his statements. The cuticle of the enamel is most distinctly seen on macerated teeth. The maceration takes place in the following manner. Fresh teeth are put into a 10 per cent. solution of nitric acid, and left in it two days, and then are kept two days in water in a dry-heat apparatus of 38° cent. (100·4° Fähr.) After this treatment the teeth are so soft that by a strong shaking they fall into a state of pap. By a slight compression between a microscopic slide and covering glass, the macerated teeth raise themselves in large tatters, or even like a hood of tender skin, which scorns tinting in any way, but shows a large number of fine pores.

PLASTIC GOLD ALLOYS.

By G. W. Bonwill, D.D.S.

In a Paper read by Dr. Bonwill, before the Odontological Society of Philadelphia, and published in the *Dental Cosmos*, the following observations occur:—

In the use of these Alloys no more mercury should be taken in the hand than is required to make a thick mass. A little might be pressed out with the fingers, but it would be difficult. When placed in a cavity bibulous paper should be laid over it, and a blunt pointed plugger used to condense it. The paper keeps the mass from slipping away under a smooth or even a rough instrument. Whatever amount of free mercury may be in it is forced to the top, and is wiped off or taken up mechanically by the paper. The mercury should never be allowed to concentrate around the margins, where edge strength is so desirable. Where the filling can be reached with the fingers, the mass can be made free from mercury by pressure with paper. The fingers are admirable adjuncts in plastic work. Wet bibulous paper is excellent for giving contour work the final touch.

Where fillings are large, several mixings of the Alloy with mercury must be made. It cannot be expected that even an expert could take a large mass of this Alloy and use it before a change occurred by crystallization.

There is great gain for an extensive contour filling in mixing at least three times. Where there are several small fillings to be made, let them all be prepared beforehand, and then what is left from one filling can be utilized in another, thus saving much material. By first pouring the mercury in the hand, there is less chance for waste, and it will not be necessary to weigh the Alloy or mercury if the operator is quick in his movements. Everything must be in readiness for filling before the mixing is begun, or hardening will commence and cause the loss of the mixture.

There is one thing that must be observed in the use of any Plastic Alloy, if success is to be looked for, and that is the necessity of so preparing the cavities that no very acute angles of Alloy are presented on the grinding or other surfaces. The walls should be covered with a thick body of the Plastic, or, if not entirely covered, the exposed part should be so shaped as to present a perpendicular line to the pressure exerted thereon, or the filling on its margin next to such exposed edges of the wall should be so obtuse that there will be no possibility of its giving way during mastication. This is a very vital point, and hundreds of teeth have had their buccal or lingual walls broken from want of such protection, even where gold had been used. I cannot emphasise this too strongly. It is so easily done with small corundum points that there can be no excuse for its omission. In many cases it is better to remove a portion of the antagonising tooth, though solid and perfect, in order that the walls may be well protected with the Alloy. When this is done, the most fragile Alloy will secure such wrecks equally with the finest gold filling, and better in many cases. Where the cavities are approximal, the most minute and difficult to fill can be reached without cutting away so much of solid tooth-structure as when gold is used.

I have found that, where gold fillings need patching, the twenty-per-cent. gold-mercury filling keeps its colour remarkably well, while others with less gold discolour badly. This observation, I think, can be relied on, and, if true, is of some importance. It is certainly inevitable that the practice of the future will make less use of gold, and that a better class of Alloys containing gold will be introduced and used in proportion as confidence increases in a good article. It will not only be more economical, but the remuneration for services will be equal to that for gold work.

Until the cheap amalgams are abandoned, we need not hope for better work from Plastics; but the period is drawing near when those who never were and never will be good operators in gold, will be enabled to perform better operations for their patients. The fear that Plastics will lower the standard of the Profession is absurd. Let every man be properly educated, and then it will not matter what he uses if he has the qualification to stamp all he does with success. The public desire that which will preserve the teeth from further decay, and retain, as far as possible, their beauty and symmetry. Patients only know what is taught them by their Dentist. Mine respect me when I tell them I am not willing to use gold as liberally as heretofore, but prefer an Alloy in special cases. Some, who have just come from the hands of others who use gold almost exclusively, make some objections at first, having been educated to believe that gold was superior to all other metals. When, however, they are reminded that failure has occurred in three-fourths of the large operations, and are assured that the Alloys can restour the contour of the cut-away, decayed, or broken teeth, and can be made far more useful than the old flat-faced, narrow, self-cleansing-surfaced filling, they arrive at correct conclusions.

With Plastics contouring can be accomplised with success, though requiring skilful manipulation; but contouring with gold is such a strain on the nervous system that few can or will bear it. Opposition to the inevitable is useless. We must resort to something besides gold in the majority of cases occurring posterior to the incisors. As to the latter, we should be ashamed of ourselves if we failed to save seven-eighths of them without resorting to filling at all. If we desire to avoid the necessity for the wholesale extraction of natural teeth, and their substitution by artificial ones, let us recognise the Plastics more largely in our practice.

Use always the materials which return the best results, irrespective of their cost or by whom made. Prepare every cavity as if it was to be filled with gold. Leave no fragile walls exposed to antagonising forces, but protect with metal. Make obtuse angles on the grinding-surface walls, that the filling may present no sharp or thin edges to be broken away. Force it into each cavity with Japanese bibulous paper under the plugger. When practicable, place a temporary matrix, made of gutta-percha, on the buccal and palatal walls, the object being to force the Alloy into a denser mass and bring the mercury to the surface. This matrix can be easily held by the fingers. Its use will be found to be of vital importance to the perfection of the operation. Shape the filling with great care as it hardens. Wet cotton or paper is admirable for contouring the surfaces. A magnifying hand-glass is a *sine qua non*, and should be used in all cases. Carefully examine the occlusion of the teeth, to avoid any subsequent dislodgement of the mass. Many Plastic fillings are rendered worthless by leaving them too full. During the hardening process go over them frequently with the burnisher. After the hardening process has been completed, thoroughly finish the margins with Scotch stone, and afterward with pumice and soft-rubber disk. Let a final inspection be made under a lens.

LITTLE HELPER.

DR. JOHN G. HARPER, St. Louis, writing to *Items of Interest*, says:—The little instrument I wish to present to your readers, has been a great help to me, and I hope that all who read these few lines may feel the same pleasure that I experience when using it.

To make the Little Helper, take a piece of hard wood, a quarter of an inch in diameter and about an inch in length. Cut in each end a groove parallel one to the other.

You now have the Little Helper; "by being put in the right place" this "little thing" will "assume singular significance." One of the places where it will help you is in finishing approximal fillings in the front teeth with slips of sand-paper or emery-cloth; the operator is often greatly annoyed by the strips slipping off the end of the tooth; this can be prevented by the Helper. After putting the strip between the teeth, the Helper is placed so that one end rests against the ends of the teeth, between which the slip has been placed, the cutting edges of the teeth occupying the groove: the other end is pressed against by the antagonizing teeth in the opposite jaw. Now take the ends of the slip between the thumb and forefinger of each hand, and draw rapidly back and forth over the filling, cutting very rapidly until the filling is dressed down to the surface of the tooth. Then turn the slip and let the back of the paper touch the filling; draw this a few times over the filling and you will have a beautiful finish.

You readily see that the hands of your assistant are free to aid you in keeping the rubber dam out of the way.

Another place where it can and should be used, is when filling a tooth that is painful when malleted on. Place the Helper as described, resting against the end of the tooth being filled, and instruct the patient to keep the tooth pressed hard against the piece of wood; this holds the tooth firm, and keeps it free from pain to the great satisfaction of both patient and operator. Also use it when filling lower teeth, as it holds the lower jaw firm. Another advantage is, it keeps the mouth open, also it is a great relief to have something to bite upon, as a person who is suffering pain will keep the jaws firmly closed. Operators who do not keep an assistant, will find this little appliance indispensable.

THE CONNECTION OF DENTAL WITH MEDICAL EDUCATION.

(From the *American Journal of Dental Science*).

WHEN the editor of this Journal entered the Dental Profession in the year 1855, the highest aim of the most reputable Dental practitioners, and especially of those directly connected with Dental teaching, was the recognition of Dental science as a department or specialty of medicine. The organization of Dental in connection with Medical Departments by such old and honoured Universities of Medicine as Pennsylvania, Harvard, and Maryland, now established facts, would at that day, as it has at the present, have elicited the warmest commendations, and been received as an evidence of the appreciation of the Dental art, not only by the medical profession, but by the intelligent portion of the public. This desire for recognition had not, during the many years it remained ungratified, become extinct, and every respectable practitioner of Dentistry who has the honour of his profession at heart must welcome such an appreciation of the Dental art, and be fully convinced of its importance in elevating the status of Dentistry to an equality with the profession of the occulist and aurist.

Although the subject of Dental education had engaged the attention of some of the most talented members of the medical profession for many years, yet until within a few years past, they were unwilling to accord to it a rank equal to that of other recognised specialties in their older and honoured science. The principal reason for such opposition in the past, was the comparatively small number of educated Dental practitioners; the majority of those who professed to practice Dentistry being persons without any professional education or knowledge beyond mere handicraft, and who had forsaken various mechanical pursuits to engage in the practice of an art which they considered to be more remunerative and less laborious. And while the desire for recognition on the part of the mother science has been cherished up to the present time, it has only been within the last two decades that Dental science has become worthy of being ranked as a department of medicine. Within the time referred to a greater number of educated gentlemen have adopted Dentistry as a profession, and by their scientific investigations and valuable inventions, have accomplished the truly wonderful and important improvements which have had such an influence in placing it in the position it now occupies, and rendering it worthy of the recognition now accorded it.

It was the dearest wish of the principal founder of the oldest of our Dental colleges, as expressed to the writer on more than one occasion, to have the institution, in whose welfare he was so deeply interested, united with the Medical Department of the University of Maryland. And we feel perfectly safe in stating, that if the majority of the Dental practitioners now connected with separate Dental schools, could secure similar positions in Dental Departments connected with Medical Universities, such Dental schools would cease to exist, and Dental teaching be conducted where superior advantages are presented to the Dental student. The intelligent public will soon begin to discriminate between the young men who are educated in a manner equal to the demands of their science, and those who are taught the mere handicraft of their art, and whose ability consists in manipulative skill, without the knowledge required to properly direct such skill. The result will be a higher grade of Dental graduates, who can justly claim an *esprit de corps* which will serve as a stimulus to both study and practice. That the days are numbered of such Dental schools as are in the habit of advising their students that the Infirmary and Laboratory will furnish all the knowledge required for the practice of Dentistry and that Chairs of Clinical Dentistry are unnecessary, is beyond doubt. When practical instruction wholly devolves upon demonstrators, such a course must surely result in a limited experience, and prove detrimental to the student who is compelled to confine himself to a particular mode of practice, which may not in all cases be a reliable one, or to the use of a particular material to the exclusion of others equally useful.

The science of Dentistry in its present status requires more than mere manipulative skill; its practitioners must be properly educated in its theory also, for it must be remembered that the reputation of every profession depends upon the intelligence of its practitioners.

We should educate our Dental students in such a manner as will enable them to meet the family physician in consultation, when the nature of a case requires it, and intelligently furnish the Dental details on which the efficacy of his constitutional treatment may depend. The Dental students should also, in many cases, be able to prescribe such constitutional treatment if called upon to do so; and such occasions are by no means rare in a Dental practice. And even if the patient, before resorting to the prescription of the Dentist, should consult his physician, the intelligent opinion of the former cannot fail to prove beneficial by an increase of respect for, and greater confidence in his professional ability on the part of the patient. Everyone judging impartially, must admit that the advantages offered to Dental students by Dental Departments in Medical Universities of well established reputation, will enable such students when they become practitioners of Dentistry to better meet the requirements of their Profession, and enjoy to a higher degree the confidence of the community in which they locate. Taking the Dental Department of the University of Maryland for an example, let us briefly refer to the connection existing between its Medical and Dental departments. In the first place, the Dental Department of the University of Maryland forms an integral part of that old and honoured institution which was organized in the year 1806, by Nathaniel Potter, M.D., John B. Davidge, M.D., Jas. Cocke, M.D., Thomas E. Bond, M.D., Wm. Donaldson, M.D., and others, and which has always maintained an enviable reputation throughout the entire country. Its Dental Department is not a mere appendage, nor is the connection so established a pretended one made merely as an offset to other institutions which have followed a like course.

On the contrary, the Dental student in the University of Maryland, has all the advantages of the medical student in addition to the Dental instruction he receives from the Dental practitioners who compose a portion of its faculty, and who have been connected with Dental teaching in another institution for very many years. The superior advantages to the Dental student of an extensive University of

Medicine cannot be over-estimated, whether such student desires to confine himself to the study of Dental science alone, or intends to become a graduate of medicine also. The opportunities for acquiring knowledge from the Surgical Clinics in a Hospital which receives 24,000 patients annually, and the experience to be gained from the Oral Surgery Clinics by an accomplished Surgeon whose reputation is so well established, should certainly prove incentives and enable the Dental student to meet all the demands upon his professional skill which after-practice may present.

It is beyond question the fact that the proper place for the study of Dentistry is the Dental Department of a reputable Medical University, when the connection is so intimate and veritable as that which exists between the Medical and Dental Departments of the University of Maryland. It should also be remembered that the Dental diplomas of the University of Maryland Dental Department will bear a date thirty-four years older than those of any other Dental school.

BRITISH DENTAL ASSOCIATION.

WESTERN BRANCH.

The fourth Annual Meeting of this branch was held at the General Hospital, Cheltenham, on Saturday, August the 5th, T. Cooke Parson, M.R.C.S., L.D.S.Eng., in the Chair. There were over fifty members present.

Mr. Browne-Mason, Treasurer, reported that the finances of the Branch were in a very satisfactory state. The receipts from subscriptions during the past year amounted to £25 10*s.*, and the balance in hand £29 5*s.* 5*d.*

Mr. C. Spence Bate drew attention to the alterations that would be necessary in the bye-laws, and the Society was asked to pass a resolution which would make all the members of the Western Counties Branch members of the British Dental Association; the subscription of those who are members of the British Dental Association being 5*s.* annually.

After some discussion a resolution amending the bye-laws, and affiliating the Branch with the Central Association was carried unanimously.

Mr. Oakley Coles moved, That papers read be the special property of the British Dental Association for publication in the journal, and that the Association should have the exclusive right over them.

Mr. Smith Turner seconded the motion.

Mr. Balkwill moved as an amendment, That all papers read be the especial property of the Branch Association, and published in the journal subject to the approval of the Branch Council.

Mr. Oakley Coles said if papers were made the property of the Association, their publication or otherwise might be decided by a Publication Committee chosen by the whole Association. He desired to relegate this duty from the branches to a representative body elected by the whole Association.

After some further discussion the original motion was carried.

It was decided to hold the next Annual Meeting of the Branch at Yeovil.

Mr. T. C. Parson read a short address as retiring President, and said he was glad to have as his successor one so well known and esteemed as Mr. Richard Rogers.

Mr. Rogers, who was loudly applauded, read his Presidential Address. Having returned thanks for the honour in electing him President on that, the fourth, anniversary of the Western Counties Branch of the British Dental Association, Mr. Rogers said he was quite sure that there was not a gentleman in the Profession who would more rigidly protect its honour and status, or one who would give a more hearty welcome than he did on the occasion of the Association's first visit to Cheltenham. Turning from a consideration of the beauties and charms of the place in which they were assembled, he offered for consideration a few remarks on what may be called the subjective aspect of their professional life. There is an objective side, which is sufficiently prominent, but perhaps they were in danger of attributing to it more than its true value, and this may induce a corresponding forgetfulness of the subjective view. Only a quarter of a century back there was no definite or well guarded avenue by which the student of their speciality might enter upon his professional career. At best the opportunities of preparation were very scant, and the possibilities of acquiring experience, save in the department of Dental mechanics, were comparatively unknown. In these circumstances the student was thrown almost entirely upon his own resources for the attainment of knowledge, for the acquisition of manipulative skill, and for the storing up of such experience as would enable him successfully to fulfil the functions demanded of him in Dental practice. Yet it should not be forgotten that there were men who, in spite of the darkness, and in defiance of disability, bravely fought their way to renown and eminence as Dental practitioners; and they did so by recognising the importance of the subjective elements of success, and by an energy that scorned to be dependent upon objective means. They all rejoiced that the darkness has passed, and that in place of disabilities they have to-day abundant facilities; still there is a danger that some may rely too much on aids which are external, and neglect the full cultivation of the power and processes that are within. Dental schools, hospitals, curricula of study, opportunities of instruction and demonstration, examinations, accredited certificates of competence, these are all admirable external aids to culture and development of the powers within. It would be impossible to exaggerate the value of the present facilities provided through the media of association, societies, periodicals, literature, etc., etc. The benefits derived from objective influences must, however, always bear proportion, not so much to the multiplicity and variety of the means themselves, as to the receptive power, or subjective condition, of those for whom those benefits are designed. The particulars of this subjective condition may be arranged in four separate classes.

First, It is hardly needful to contend for the cultivation of *Self-reliance* as a prominent attribute of professional character. The spirit of self-reliance is the very root of vigour and strength. "Heaven helps those who help themselves," says the proverb—and Socrates said, "Let him that would move the world first move himself." Men who have shone in science, literature, and art, "The apostles of great thought, Lords of the great Heart," have all exhibited markedly the spirit of self-reliance. There is no walk in life wherein a man can safely rely entirely on others, nor is there any calling in which a self-reliant character is of a more essential value than that to which they all belong. Self-reliance is not self-conceit, though it necessarily begets self-confidence. They need to rely on their perceptions, in order to diagnose the conditions of each case presented to their notice. They need to rely on their judgment as to the best mode of treatment, and so to rely as not to be moved by undue commiseration or inopportune entreaty. They need to rely on their skill, so as to proceed calmly and carefully to the performance of their operations. Self-reliance begets confidence and inspires respect on the part of the patient, while at the same time it allows the operator, freed from anxiety, to concentrate all his resources upon the work before him. On the other hand, the absence of this quality renders the perception dull and obtuse, causes the judgment to halt and mislead, and, worst of all, it imperils operative success, through timidity and hesitation. Self-reliance needs not the assistance of self-assertion. The nature which is self-dependent, is for the most part self-contained. It asserts its power in action more than in speech, by moral influence rather than by laudatory expressions ; nevertheless, when called upon to express an opinion, or give advice and encouragement, the self-reliant man will express himself in a tone and manner calculated to convince and control his patient, to assure and comfort him. Self-reliance, invaluable as it is, cannot, however, do duty for any of the other necessary attributes of professional character ; *ergo*, it cannot be a refuge for ignorance. On the contrary, the only possible foundation of self-reliance is knowledge.

Secondly, Of *Self-culture*, Gibbon says, "Every person has two educations, one which he receives from others, and the more important which he gives himself." Schools and hospitals may provide the first, but no power on earth can confer the second, if it be not inherent as a habit and purpose of life. No greater mistake was ever formulated than that conveyed in the expression "A complete education." For a professional career constant growth is essential, not alone to keep pace with new methods and discoveries, but to pursue by the help of practical experiment, the lines of study and investigation commenced in youth. It is said that the Duke of Wellington, when once looking at the boys engaged in their sports in the playground at Eton, where he had spent his own juvenile days, made the pregnant remark, "It was there that the battle of Waterloo was won." The energetic and persevering who are careful to use up fragments of time in self-culture are ever the men who make progress, let the particular department of their labour be what it may. Drew studied philosophy while cobbling shoes; Hugh Miller taught himself geology while working as a day labourer in a quarry; Sir Joshua Reynolds was such a believer in the power of industry, that he held it possible to all men to achieve excellence if they would only exercise the power of assiduous and patient work. "If you have great talents, industry will improve them, if you have but moderate abilities industry will supply their deficiency. Nothing is denied to well directed labour; nothing is to be obtained without it." Buffon said of Patience, that it is Genius; the power of great men consisting mainly, in his opinion, in their capacity for continuous working and waiting. In order to aid intellectual culture, there should be a wholesome and regular supply of mental sustenance. General knowledge is invaluable to a Dental Surgeon. To be able to converse intelligently upon various subjects, and so divert attention, and render the time spent in the operating chair agreeable to the patient, is an important factor in success, and this can only be done by him whose mind is well stored, and whose resources are continually replenished. The standard works relating to their craft should always be at hand for reference; and turning to them at times of doubt, so far from being a token of ignorance, will be regarded as an evidence of thoughtful care, and desire to do the best. A tolerable knowledge of one or more of the arts, music, painting, etc., and a fair idea of the latest scientific discoveries, together with the rare faculty of drawing out the conversational powers of patients,—all these are invaluable acquirements to a professional man, and they come as the reward of intellectual culture, sustained and methodical.

There is, too, a part of human nature which cannot be neglected with impunity, namely, the moral character. In a professional career character is essential, and like a delicate plant, character needs culture and care, nourishment and protection. Perhaps integrity may be mentioned as the first element of a good character. To be *true* in word and act, they must be true in thought and desire. This is not always natural; it comes as the product of watchful and faithful obedience to a great principle, expressed in the golden rule of "doing to others as we would they should do unto us." No failing is more conspicuous than lack of veracity, and no virtue more sure of recognition than sterling integrity. Punctuality, in regard to engagements should characterise a professional man, and a Dentist of all men. It not only systematises labour and simplifies duty, but it has the peculiar attribute of begetting itself in those with whom they are associated. Patients soon learn that a Dentist is or is not punctual in his appointment; and, as a rule, they are gracious enough to assist him.

Thirdly, There are few callings more exercising to human patience and *Self-control* than the one to which they belong; and very few days pass in which they are not made painfully conscious of the need for thorough mastery over their temper and tongue. When patients come in declaring that all the fillings have come out; that they can do nothing at all with the set of teeth which have been constructed with the utmost care, and fitted in with conscientious exactitude; when some one more cheeky than usual vociferates in the waiting room, before several others, that the root of the tooth, the extraction of which was attempted the day before, had been left in; and when other of the thousand and one annoyances of general practice occur, they need to have themselves well in hand, to restrain the reply that rushes to the lips, to repress the frown that involuntarily beclouds the features, and preserve in unruffled serenity, both their inward thought and outward demeanour. There is but one foundation upon which self-control can rest securely, and it has but two component parts; first, a knowledge of individual weakness; secondly, a conscientious discharge of every duty. If a man has a short temper, he should never forget the fact—if he has a gift for smart repartee he should ever bridle his tongue.

Fourthly, There is *Self-contribution.* This he considered a clumsy phrase; but contented himself with it in absence of a better. Of all phases of human nature, the selfish is the most despicable; and of all characteristics which command the admiration of others, and truly ennoble the nature itself, there is none so estimable, so exalted, or so attractive as the habit of living for the good of others, and striving to promote the happiness of the human race. This is true as a general principle—and it is the very essence of common Christianity. In relation to their Profession, he meant by self-contribution the willingness to communicate their knowledge and experience for the increase of the common stock. They never understood a subject so well as when they were making an effort to describe or convey their ideas to some one else; and no greater fallacy has ever deceived mankind than the supposition that one loses anything by communicating knowledge to others. Facilities for interchange of thought, and comparison of experiences, are now abundant; and the pleasure as well as the profit to be gathered from these facilities will always be proportionate. They had taken a new departure as a profession, and the roll of honour in future will contain the names, not of those who selfishly seclude themselves in the sacred satisfaction of their own surroundings, nor of those who come out of their shells once now and then, simply to pick up all they can, and then retire to enjoy the benefits thereof—but inscribed on the records of the future, there will appear in the foremost page, the list of those, and only those, who have been willing to spend and be spent, for the truest advancement of their most useful department of labour, and who have devoted their energies and their lives to the honourable purpose of promoting the comfort and happiness of their fellow men.

Several Papers were read, and in the evening a Dinner was held presided over by the President, Mr. Richard Rogers.

ASSOCIATION MEETING.

The Annual General Meeting of the Association was held in the rooms of the Medical Institute, Liverpool, on Friday and Saturday, August 25th and 26th, Mr. Thomas Underwood, Vice-President, occupied the Chair, in the unavoidable absence of the President, Mr. John Tomes, F.R.S. There was a large attendance of members, and the several branches were represented in goodly numbers.

The Chairman regretted that their excellent President was unable, owing to the illness of his brother, to be present at the meeting. He had begged him to express his extreme regret at his inability to attend that, the second, meeting of the Association.

The Treasurer (Mr. James Parkinson) reported that the subscriptions due on the 1st of January last amounted to £124; the balance in the bank was £311 18*s.* 6*d.*; arrears, £160 13*s.*; cash at interest, £150, being a balance of close upon £630, minus the subscriptions in arrear.

Mr. J. Smith Turner, Hon. Secretary, read his Report, in the course of which he dealt with the history of the Association, and the advantage that had been taken of the Royal Commission on the Medical Acts to make known the wants of the Profession, and to defend the position they had attained. The Report also stated that

The numerous fresh cases of infringement of the Dentists Act which were continually being brought before the Business Committee, as also the infringement of the Rules of the Association, had so far been met by moral force. Now that the Medical Council had left them to their own devices, the Secretary hoped they would be able to attend more diligently to all such cases. The roll of the Association contained the names of nearly 500 members.

Mr. CHARLES SPENCE BATE, F.R.S., of Plymouth, was nominated President-elect for the ensuing year, and Mr. THOMAS UNDERWOOD was re-elected Vice-President. It was also decided that the next meeting of the Association be held at Plymouth.

The CHAIRMAN read the Valedictory Address of the retiring President, Mr. JOHN TOMES, which was one of great interest. The Address dwelt at great length upon a matter which had been the subject of controversy between the Association and the Medical Council, respecting the inclusion in the Dentists' Register of persons engaged in a calling which was not recognised in the Dentists Act, and which calling barred them from registration in the Dentists' Register. The Association had sought to obtain the correction of the Register, and failing this had requested the Medical Council to take a judicial decision on the point. To this request the Executive Committee of the Medical Council had replied that it rested with the Association to obtain a judicial decision; and, accordingly, it now remained for the Association to decide whether under the circumstances any, and, if any, what further steps should be taken for the furtherance of a correction of the Register. The President concluded his Address by remarking that a general review of the past year gave ample proof of prosperity and success, but in leaving the Presidential Chair he desired to call the attention of the Association to the too obvious fact that there were hostile influences which it would be the duty of the President and Representative Board to carefully watch, and, if need be, to antagonise. This watchfulness would be especially necessary when the promised Medical Bill came before Parliament. Of all their enemies, however, the one they had most to fear was apathy in their own ranks.

A very cordial vote of thanks was accorded to Mr. Tomes for his services as President since the formation of the Association.

Mr. H. CAMPION moved, and Mr. R. ROGERS seconded, the following resolution:—"The British Dental Association, while it wishes to express its gratitude to the Medical Council for the many and highly important services rendered to the Dental Profession in past sessions, views with deep regret the renunciation on the part of the Council of the judicial powers conferred upon it by the Dentists Act in favour of following a personal leading in respect to even entering upon a consideration of the correction of the Dentists' Register."

A vote of confidence in the Representative Board and Business Committee having been passed,

Mr. Henry Campion, M.R.C.S. (Manchester), President-elect, then took the Chair and delivered an Address. Having returned thanks for his election, he stated that the Association was established for the promotion of Dental and the allied sciences, the maintenance of the honour and interests of the Dental Profession, by periodical meetings, the publication of a journal, and occasionally of transactions and other Papers, the formation of a benevolent fund, the maintenance of the spirit and provisions of the Dentists Act, and other things incidental or conducive to the attainment of the above objects. In order to supply that element of social and professional intercourse so essential to the well-being and to the further development of their Profession, he thought one of their first efforts should be to make their meetings as attractive as possible, in the hope that all the members of their Profession in the immediate district in which the meetings were held would thereby be ultimately induced to join the Association. After going fully into the benefits to be derived from the Association, he warned them not to expect too much from the Dentists Act, which, although it gave them certain privileges, was designed as much, or even more, for the protection of the public than for the benefit of the Profession.

At the afternoon meeting Mr. C. S. Tomes, F.R.S., read a Paper on "Some of the Scientific Problems of Dental Surgery."

He alluded to the literature of the Profession, which, though voluminous, may not be practical, and remarked upon the principles of Antiseptic Surgery, calling particular attention to Alveolar Abscess. In a Paper by Dr. Alexander Hodgson it was stated by the writer that he had found micrococi in all acute, cold, and chronic abscesses, and micrococi and bacteria in all alveolar abscesses which he had examined. Pus from an acute abscess injected into an animal produced abscess; but this was not the case with pus from a cold abscess. Micrococi do not tend to putrefaction, but bacteria do. There were four varieties of these micro-organisms, namely, the small circular Micrococus, which were either united together chain-like or in clusters; the oval bacteria; the long rod-shaped bacteria; and the spiral bacteria. In putrid fluid there are always found the three forms of bacteria. It was a very important question to ascertain how these bacteria gained access to the pus—were they from without or from within? When a tooth receives a blow the pulp not infrequently dies, and, notwithstanding its being protected from, and having no apparent communication with, external influences, the formation of stinking pus results. Were there bacteria in this pus? If so, they must have got there from without. On the other hand, if no germs were found, then their views on Septicism must be modified.

He then divided the causes of Alveolar Abscess into three groups, giving as an example of the first, a pulp which was not actually but approximately exposed and, after treatment and filling, eventually dies, and alveolar abscess occurs, and the pus swarms with micrococi and bacteria. It may be said that the organisms got into the pulp through the dentinal tubuli of the previously carious cavity; but he asked is their presence an accident, or are they the cause of the abscess? Upon the answer to this question would depend their line of rational treatment. In the zone of inflamed pulp from exposure there are evidences of bacteria; but are there any evidences of inflamed pulps in which there are no micro-organisms?

Secondly, there were the cases already alluded to of dead pulps, the result of a blow. According to accepted notions of Antiseptic Surgery the resulting pus ought not to putrify, but they as Dental Surgeons knew that it did putrify in nine instances out of ten. He had found such pulps stinking enough, but he had not found in the pus either micrococi or bacteria; but his observations had been very limited, and they need to examine a very large number of specimens before they could determine this point. It was a matter of general observation that abscess was slow to follow from this cause, whereas abscess from death of pulp through exposure is almost sure to come.

Thirdly, there were those abscesses that recurred after a root had been filled and completely shut up, with Antiseptic precautions. The pus in such cases does contain germs. Mr. Tomes here referred to a Paper on Alveolar Abscess, which was read at the Medical Congress last year by the late Dr. Dean, in which the use of the rubber dam was recommended in the treatment of abscess to exclude the saliva, the access of which was an element of failure.

He had nothing to give in the way of proof, and he could not tell whether alveolar abscess could not arise without germs—a question which required many observations. Cold occasionally caused a dormant abscess to become acute; but, under ordinary circumstances, disease germs, to which we are constantly being subjected, were eliminated by the kidneys, and no harm resulted.

Mr. Tomes then said, in reply to Dr. Walker, that pus could be readily examined by carefully placing a little upon an ordinary microscopic cover glass, and passing this through the flame of a spirit lamp to coagulate the albumen. This can then be kept to be stained and examined at leisure.

Mr. W. Bowman Macleod read a Paper on "Mechanical Dentistry: its Prospects and Probabilities," in which he reviewed the antiquity of Dentistry; and that Dentistry was an ancient art there was ample proof from the Jews, the Roman and the Greek poets. The rise and progress of the art was noted, and the third quarter of this present century had been more productive than the preceding half. With the preliminary education, and the systematic and scientific training which was required of the student of the Dentistry of to-day augured well for the future. Between the instrument maker and the Dentist as they knew him there was no comparison ; and while with good men, good material, and good instruments, they had achieved much, they must still endeavour to improve.

Mr. COLEMAN read a communication on "The Treatment of Dead Teeth with Arsenious Acid," which, in principle, was represented by the following typical case :—A tooth in which the whole, or nearly the whole, of an exposed pulp had lost its vitality, and had become putrid and, through the dentinal tubuli, affected the cementum. To bring such teeth into aseptic condition is often difficult. But after removing the softened dentine and fragmentary contents of the coronal portion of the pulp-chamber, and treating with carbolic acid, he covered over the pulp cavity with paper on which was a small quantity of Arsenious Acid, and filled with an osteo filling. Mr. Coleman recorded many successful cases, also one case which was unsuccessful, but which eventually yielded to treatment with eucalyptus oil. Arsenious Acid was a widely used Antiseptic, but there was considerable prejudice against it on account of its irritating properties. Notwithstanding, his experience of it for the last ten years, when used in the way he had mentioned, had been a very successful one. He considered that the Acid formed an insoluble albuminous compound with the remnant of the pulp ; and that it was impossible for the Arsenic to pass beyond the pulp either by the apical foramen, or through the dentine and cementum.

Mr. CRAPPER made some observations upon the formation of a Benevolent Fund ; and it was stated that a committee had been appointed to consider the question.

Mr. FREDERICK CANTON read the notes of a case of Neuralgia in the edentulous upper jaw of a sailor who was a healthy man and aged seventy-two. Mr. Canton having tried different means, eventually drilled three or four holes into the bone of the jaw. This gave great relief, the patient having since had only one or two attacks. Mr. Canton quoted Prof. le Gros' description of similar cases, who gave it as his opinion that the pain was due to compression of the nerve twigs by the formation of osseous substance in the nerve canals of the absorbed bone.

Mr. CUNNINGHAM, in a Paper on "The Use of Amalgam in Contour Filling," advocated the employment of matrices, and absorbing the excess of mercury worked to the surface by means of wafers of well squeezed Amalgam, rather than with tin or gold foil. Matrices may be made of vulcanite, steel, ribbon, platina, etc. He advocated giving to Amalgam work the conscientious care and attention to detail that its use deserves.

Mr. E. LADMORE minutely described the structure, manufacture, and use of the Electric Mallet.

(SATURDAY.)

Several demonstrations by Messrs. Quimby (Liverpool), Rogers (London), Matheson (Manchester), Browne (Nottingham), and Cunningham (Cambridge), were given at the Liverpool Dental Hospital. There were also exhibited recent improvements and novelties in Dental appliances.

On the resumption of business at the Medical Institute,

Mr. BOWMAN MACLEOD showed a regulation case by Mr. Bonnalie, of Chester. It was for forcing teeth outwards. A hinged flap, which came against the lingual surface of the tooth to be moved, was actuated by the tension of an elastic band ; and the plate could be readily removed and replaced by the wearer.

Mr. MACLEOD then proceeded to supplement his Paper of the previous day by remarks on taking impressions, and said that plaster of Paris will give a correct impression of the surfaces with which it comes in contact. But the act of taking the impression dislocates the relation of parts, particularly the folds of mucous membrane around the alveolar sulcus, and at the posterior part of the hard palate.

Mr. OAKLEY COLES suggested the patient closing the lower jaw upon the impression cap, and, by relieving the tension of the cheek, which an open mouth caused, the displacement of the several parts already mentioned would be overcome.

Observations were also made by Mr. Sewill and Mr. Turner; and a member showed his method of making special impression trays, which he cast in one piece in plaster moulds.

Mr. TURNER explained his method of accurately adjusting Obturators to the piece fitted to the teeth and hard palate. He placed the velum in position by means of a piece of copper wire, which was placed in the hole for the retaining pin and then bent over the front teeth. A plaster impression was taken of the hard palate and this wire *in situ*, and the model from this gave the exact relation of the two parts of the mechanical appliance.

Mr. SEWILL read a paper on "The Etiology and Pathology of Dental Diseases: what we know, and what we should like to know."

Mr. OAKLEY COLES read a most interesting paper on "Dental Literature" ; and the Honorary Secretary, on behalf of

Mr. S. J. HUTCHINSON, read a paper on "The Dental Diploma: what it is, and what it is not." The diploma was a license to use the name of Dental Surgeon, or its synonyms, but it was not a license to practise medicine, surgery, or pharmacy, or to practise as an apothecary. The L.D.S. was an evidence to the public that its possessor had, either by long practice and by examination, or by curriculum and by examination, satisfied the examiners of the College of Surgeons of his fitness to practise Dental Surgery. The law of the land was jealous of the integrity of the title of Dentist, and would not allow it, under penalties of fine or imprisonment, to be used by any one unregistered on the Medical or the Dental Register. With regard to the Medical Register, the law was equally jealous, and allowed no one to use any title which should imply that he was on this register unless qualified, and the L.D.S. was not found amongst the qualifying list of diplomas and degrees. A Dental Surgeon was not a surgeon, and if he undertook an operation out of his province he tacitly pretended to be a surgeon, and as wilfully and falsely represented himself to be one as if he had blazoned it forth to the world. During operations under nitrous oxide gas a surgeon should always be present. He did not for a moment suppose that the medical profession would grudge the small gain which a Dentist might occasionally find from the performance of a surgical operation, but the leaders of the medical profession and medical legislators would nevertheless certainly resent, and probably with effect, the usurpation of medical practice by Dentists. There was always a danger—although, of course, remote in trivial operations—that a fatal issue might result; and in that case, as the Dental licentiate would be unable to give the usual certificate, an inquest would be held, and possibly a verdict of manslaughter returned against the operator. In the second place, in the event of the operation turning out badly, the practitioner would lay himself open to an action for malpractice; and, under such circumstances, the commonly-accepted limits of Dental practice must necessarily prejudice the defendant, who would be lucky if he escaped being mulcted in heavy damages. These and many other considerations which might be adduced should surely suffice to restrain Dental Surgeons from venturing upon such dangerous ground as was involved in trespassing beyond the well-known limits of their speciality. It was because he was such a believer in the L.D.S. as the qualification for a Dentist, and because he believed in the Dental Act and in the British Dental Association, that he implored the members of the Profession to take away the sting of the reproach hurled at them by Dr. Quain that they were "a class of partially-educated practitioners who considered themselves fully competent to treat diseases constitutionally in every sense of the word." Let them stand forth to the Medical Council and to the world as a body of fully-educated Dental practitioners who knew their work—what it was and how to do it.

Mr. COLEMAN contended that nitrous oxide should never be administered except in the presence of a second person, and, as a rule, that second person should be a medical practitioner.

Mr. STOREY (Hull), thought that the Dentist was justified in administering the gas if he had a properly-qualified assistant in the room. Though it was most desirable that a medical practitioner should be present, yet they could not offer him less than half a guinea for his attendance, and patients ojected to pay that amount in addition to the half a guinea which was little enough for the Dentist himself to charge.

Mr. SEWILL said attempts had been made in this country, as well as in America, to widen the field of Dental Surgery. A great deal had been written on the subject, especially in America, and at the Medical Council their arch-enemy had seized on these utterances in attempting to damage the prospects of the Dental Profession. If they wanted more legislation they should take care that they did not give cause for these attacks. The old maxim, "Let the cobbler stick to his last," was not a bad maxim as applied to the Dental Profession.

Other members having taken part in the discussion, the proceedings concluded with votes of thanks to the Medical Society for the use of their rooms; to Dr. Waite (local Secretary) and the Reception Committee; to Mr. Smith Turner (general Secretary); to the readers of Papers and the demonstrators; and to the President.

THE DINNER.

The annual dinner of the Association was held on Friday evening at the Adelphi Hotel. The President, Mr. Campion, was supported on his right by his Worship the Mayor of Liverpool, and on the left by Mr. C. S. Tomes. There was a large company present.

After the usual loyal toasts had been honoured,

Mr. COLEMAN gave the "Manchester School of Medicine," and alluded in complimentary terms to the teaching of Owens College and the Liverpool School of Medicine. Dr. SIMPSON responded.

Mr. OAKLEY COLES, in a most humourous speech, proposed "The City and Trade of Liverpool," and said it was a felicitous circumstance that the first meeting of the British Dental Association in a provincial town should be held in Liverpool, whose chief magistrate they were so glad to see present. The first and fourth Dentist that practised in America were from the ancient town of Liverpool; and it was a matter for congratulation that that town, which was the watergate between the old world and the new, was the place of the first provincial meeting of their Association.

The MAYOR, in reply, said as the chief magistrate of that great city, he was glad to welcome the British Dental Association, and to extend the hospitality of Liverpool to its members. Although he had set apart the present time as a portion of his holidays, he thought it his duty to respond to their invitation to be present, considering that this was the first visit of the Association to Liverpool. He would he had fully known the influential nature and importance of the Association that he could have extended the hospitality in an official form at the Town Hall. However, he wished the Association all prosperity.

Mr. A. J. WOODHOUSE proposed the health of "The President," who, in reply, said it was with mingled feelings of pleasure and regret that he rose to speak to them. Would that he could merit the dignity and maintain the honour of the position in which he had been placed.

Mr. C. S. TOMES proposed "The Liverpool University College and School of Medicine," which was responded to by Dr. GLYNN.

Mr. EDGAR BROWNE gave "The British Dental Association," to which Mr. TURNER and Mr. R. ROGERS replied. Other toasts having been honoured, the company separated.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

THE PROPERTY OF BRANCH PAPERS.

To the Editor of the DENTAL RECORD.

SIR,—Though the Meeting of the Western Branch Association was successful, and the executive is to be congratulated upon the efficient arrangements which undoubtedly conduced to that success, there was not perfect unanimity of feeling on certain items of business that were discussed and resolved upon. I refer specially to the Parent Association claiming for its absolute use the Papers read at the Branch Meetings. As one who is not unacquainted with the very meagre manner in which, on previous occasions, Papers have been slighted and even ignored by the Journal Committee, I certainly sympathise with the minority who raised their voice and voted against the resolution.

It may not be generally known that many of the Members of the Central Association who were present at the Branch Meeting only became Members of the Branch on the day of Meeting. In this way was a majority strengthened, if not obtained, to carry the point alluded to. By similar strategy can a sufficiently large group of Members of the Central Association attend a Branch Meeting and carry any new rule they may desire, however unfair and detrimental it may be to, or against the wishes of, the majority of the County Members of the Branch.

The principle of this resolution may be good theoretically, but with recollections of the past treatment of Branch Papers by the Association Journal, and with the desire, which I am sure is widespread, that the periodical literature of our Profession should not be represented by one journal only, I do think that this very arbitrary rule, passed as it was, should be rescinded, or at the very least not be enforced.

Yours, &c.,

August 16, 1882. A MEMBER.

INTERCOMMUNICATIONS.

QUESTIONS.

(10.) VERAX.—Can any reader supply me with the exact composition of "Babbitt Metal"; its melting point, centigrade; atomic weight, specific gravity, and resistance to force or crushing power? Also, where it can be obtained, and at what price, and what are its advantages over Zinc to the Dental Mechanic in using for his dies? Although I understand it has been in use for nearly thirty years I see no mention made of it in Fletcher's "Dental Metallurgy, 1881," unless it is the alloy given at bottom of page 59, but to which no name is attached.

(11.) INSTRUMENT.—Will some reader be good enough to inform me if there is any other means of telling the temper of steel instruments, besides the colour-straw, blue, etc., to which they are brought down after hardening?

THE

DENTAL RECORD.

VOL. II. OCTOBER 2, 1882. No. 10.

A NEW MODE OF APPLYING VACUUM CHAMBERS.

By FRANK H. BRIGGS.

OWING to the soft tissues of the palate being drawn into, and adapting themselves to the form of the vacuum chamber of an upper denture, the chamber is rendered practically useless in a very short time. Knowing what great advantage would be gained if this objection could be overcome, I have invented a method by which the soft tissues may be permanently excluded from the chamber, thus rendering it of greater value.

In making a denture entirely of vulcanite, the first thing to be done is to press a piece of platinum gauze so as to fit the centre of the palate of the model to be worked upon. The size of the gauze must be a little larger than the zinc disc. Over this place a zinc disc to form the chamber. (The zinc should first be cut to the shape desired, placed on the model, and heated by the blow-pipe until it fits. It should then be made smooth to give the chamber a polished appearance when finished.) Next set up and pack the piece in the ordinary way, taking care not to move the disc or gauze in doing so. In sinking the piece care should be taken to run the plaster well between the wires of the gauze, which is in immediate contact with the zinc, as it helps to hold the zinc and gauze together, and also to keep out the rubber. To remove the zinc immerse the vulcanite piece in sulphuric acid, which must be diluted with water, or zinc sulphate will be formed as a coating to the zinc and stay further action.

When gold strengtheners are used adopt the same method of procedure as above, with the exceptions (1) that the piece must be sunk into the flask with the teeth downwards; (2) that the zinc disc and gauze must be fastened on the model with a short pin, the head of which must be small enough to pass through the gauze without injuring it when finished.

When the base is all metal, the plate should be struck up in the ordinary way, and a hole cut through the palate where the chamber is required. The plate should then be fastened on the model, and a wax or metal disc, a little larger than the hole through the plate, fastened over it. Fresh dies should then be cast, and a cap or box struck up to fit over the disc. A disc of gauze should be soldered over the hole in the plate on the lingual surface, and the cap soldered over this, thus making it guarded at the opening as in vulcanite. I use zinc for the disc because it is easily dissolved, and every Dentist has it in his workroom.

Another process on the same principle is as follows:—Make a frame of metal the size of the chamber required, by filing out the centre of a gold disc, or by bending wire and soldering the ends together; then solder a piece of plate across the frame, and upon the frame solder the gauze. Make a zinc disc a little smaller than the frame, and press both into the shape of the model. Pass a gold screw through the centre of the zinc and frame, so that the point projects a little above the surface of the zinc, and is embedded in the vulcanite when finished. Place this upon model as you would a plain lead disc.

The object of the screw is that the lid may be removed.

A PLEA AGAINST PULP EXTERMINATION.

By Frederic Rose, L.D.S.Eng.

I am tempted to go over this much-worn ground because having, during the last year of my time at Hospital, and since then in private practice, directed my very special attention to the subject of Pulp Capping, I am vain enough to believe that a brief record of my experiments and the successes attending thereon, may assist those of my professional brethren who have not been fortunate enough to find that process a very successful operation, in saving the large majority of pulps that are presented for treatment.

I had taken a large number of interesting notes of cases treated on the system I am about to advocate during my time at the National Dental Hospital, but unfortunately the book containing them has got mislaid, and a record of all my cases copied from the books of the Hospital is too meagre to afford more than a mere reminder of some of the cases; I therefore must request my readers to be content with a statement of my *modus operandi*, and verify what I say by personal experiment.

I got the first idea of this method of treating pulps from my friend, Mr. W. R. Humby, of London, whom I here thank for a suggestion which has completely revolutionized my practice on this one head.

Now, when a patient comes to the Dentist in violent throes of toothache, what is the general line of conduct followed by, I venture to say, at least eighty out of a hundred practitioners? If the tooth be only a hollow shell, very likely the patient gets relieved of his pain by the detestable operation of extraction, and goes away perfectly satisfied both with his own bravery and the Dentist's skill. If the tooth be not very badly decayed an examination is made with the mirror and the probe, and if a pulp exposure be discovered a napkin is stuffed into the mouth, the cavity wiped out more or less carefully, according to the Dentist's notion of how much dryness is necessary, and a dressing of arsenic, either with or without other medicament, is placed on the exposed pulp, and sealed up with cotton and mastic. For some hours the patient suffers a nasty dull gnawing pain; he comes back the following day; the napkin is again stuffed into the mouth (yes, even by good dammists, who think the "dam" unnecessary for such a short matter as a dressing), the tooth is cleared of carious dentine; the disintegrated pulp is removed with a most lively touching-up of the remnant in the fangs; a dressing of creosote and tanning or other antiseptic carefully passed down the fangs, and sealed up with mastic. The patient goes away happy that there is no more pain, and the operator shakes hands with himself at the very skilful way in which he has passed the dressing to the *very apex* of the fangs. There are one or two more visits (fees, of course, each time), and finally the tooth is filled;—a dead member ready to act as a foreign body at any time the patient's health becomes deranged either by cold or stomachic disorder, and causes sufficient inflammation as to necessitate the removal of the tooth. It may have lasted for ten years, but very frequently it only lasts a year or two. On the other hand, if we can succeed in saving the pulp, or even a remnant, we maintain conditions suitable for resisting constitutional ill health.

What I have just said applies more particularly to back teeth; if the tooth be an incisor or a canine the nerve-barb is at once resorted to, a course which, if gas be not administered, gives the most excruciating agony. One of the first duties of the Dentist, I take it, is the saving of pain, if it can be done consistently with preservation of the organ; and as a matter of fact, the man who gives the least pain by his treatments will be sure to be the one most resorted to, as the public generally are more bent on saving pain than on the conservation of the tooth. Again, many Dentists, amongst whom are some of our leaders, have quite a strong conviction that once a pulp be exposed, be it pale and healthy, or red and inflamed, no matter, the most satisfactory treatment is to destroy it; not having faith that dentine of repair will eventually form as a protection to it. Now I maintain that, without exception, if a pulp be healthy, and be properly treated, it need never again cause uneasiness, and it may be covered at once with a permanent filling. In this statement I believe I shall have the acquiescence of the large majority of the leaders in our Profession. But I will go further. I am convinced, basing my conviction on about two years and a half of attentive experiment, that the treatment

I am about to advocate will, by careful operators, be found successful in saving a very large proportion of inflamed pulps; and though useful for healthy exposures, it is in cases of inflammation that it has advantages over methods already tried.

The patient first presents himself in an agony, and points to a tooth which has a large cavity in it. From the nature of the pain, length of its endurance, and the appearance of the tooth and gum, I diagnose that there is a pulp still left, and that it is in a state of inflammation, before I even look at the tooth. I then carefully wash the cavity with warm water, and at once slip on the "dam" (which let me here remark for the benefit of those who reject its use as too tedious for short operations, that it can, with practice, be slipped on in from two to four minutes in the average run of cases). The dam being adjusted, I gently dry out the cavity with bibulous paper, and then examine it thoroughly. Doing it in this careful way, one is able to ascertain the exact condition of the pulp. We find an exposed and inflamed pulp, and still aching violently. The first thing to do is to direct a current of warm air into the cavity. This, as a general rule, at once removes all pain from the organ, or at least reduces it to a bare sensation; the effect of which may always be perceived by the troubled look on the patient's face being replaced by one of ease. Coincidently with the cessation of pain, if we watch closely, we shall see the swollen and inflamed exposed portion of the pulp recede from the surface, somewhat like a worm retreating down its hole.

Now, the natural query is, "What is the cause of this, and what significance has it to the treatment?"

My theory is as follows, and I think the results justify the theory:— When the dentine is attacked by caries it becomes infiltrated with moisture, and as it softens it swells. As it approaches the pulp, and extends to its surface, the swelling of the dentine causes pressure on it, which, being enclosed in a hard box, causes pain by the compression of the nerve filaments; the irritation brings about a hyperæmic condition, which increases the swelling, and consequently the pain. If the decay has extended far enough to denude the pulp completely of dentine at one spot, at that spot will it tend to protrude. When we dry this off with the draught of air, we contract the carious dentine and remove some of the pressure from the pulp, at the same time drying the surface of the pulp. This would account for the recession of the exposed portion, which I have so often observed on the application of the air. By the removal of the pressure we get cessation of the pain.

I now have my cavity perfectly dry, and ready for excavation. If the pulp be not in an excessively inflamed condition, it requires no medicaments; and I may further state my belief that where we can possibly do without them we give the pulp a much better chance. I have frequently seen cases of pulps taking on an unhealthy action, where the cause has been, I feel convinced, carbolic poisoning. I now excavate the cavity, taking care to give the pulp a wide berth, and leaving as strong a floor of the carious dentine as is consistent with a properly shaped cavity. I now take a pledget of cotton wadding, steep it in copal-ether varnish, and swab the cavity thoroughly; then cutting with my scissors a suitable sized disc of the thin cork, such as Mr. Fletcher uses for his advertisements, I dip it into the varnish, and carefully adjust it over the exposure, and again apply warm air.

Now, if there has been much inflammation in the pulp, before we stop the tooth we want to provide against a contingency, which nearly always arises, viz., the accumulation of serum and gases under the filling, causing pressure and pain, and the necessity for removing the stopping. Before I saw Mr. W. Victor Ditcham's valuable contribution to the last November number of the *Record*, I used a very clumsy way to effect this, though it sufficed; but since then I have tried his method and am delighted with the results. His method can be applied to gold fillings as well as plastics; as I did it, I had to content myself with plastics. I used to lay a piece of silk thread across the exposure, fill over it, and when the filling was in, withdraw it, while I firmly kept the stopping steady with the thumb of the other hand. But I recommend Mr. Ditcham's plan as much neater and more workmanlike, and refer my readers to it, *loc. cit.* After from ten days to a fortnight, during which time one or two light mastic dressings may be changed in the tube to keep out the food and saliva, the drainage tube may be filled up. If I think it advisable to use any medicament to the pulp, I prefer two or three coats of weak solution of iodine painted on to the exposure with a camel hair pencil. I avoid carbolic acid strictly, except of an antiseptic strength. It is often advisable to administer a purge during the local treatment, to assist Nature in subduing the inflammation.

In cases of simple exposure the same treatment is adopted, leaving out the tube. I prefer cork next the pulp, and for plastic fillings it is all that is necessary; but for gold fillings I use a gold, platinum, or quill dome-shaped disc over the cork, to give strength to fill upon.

I omitted to mention the object of the varnish. It is to render the Dentine impervious to the shocks from thermal changes through the metallic filling, which it certainly most effectually does. The principle of the treatment is, that the moisture in the protoplasm in the tubes, by capillary attraction, draws up the ether in which the gum is dissolved, and along with it particles of the gum; so hermetically sealing up every tube, and practically capping each individual pulp filament.

I append a record of one of my early efforts in this direction written from memory, assisted by the record in the books of the Hospital; and alongside it one I have in course of treatment at the present time, which I expect to have completed successfully before my paper goes to press.

From August 1st, 1881, to August 23rd, 1882, the results of my treatments of unmistakably exposed pulp are as follows:—

53 cases treated on foregoing plan.
7 caused so much pain after the warm air treatment as to necessitate destruction.
5 cases exterminated either by arsenic or barb without having recourse to treatment.

N.B.—In every case where the pulp has been exterminated the treatment has been dictated, either by the low vitality of the patient, or through a want of patience to go through with the case.

48, total number of successful cases.

These cases exclude all my experiments in the Hospital.

Case I.

March 10*th*, 1881.—Margaret A., æt. about 30, sent upstairs from extraction-room to have a left upper 1st molar treated; the 2nd bicuspid having been extracted that day without alleviation of the suffering. On questioning patient I learned that the pain she had suffered, and was then suffering, was of the acute shooting kind, pointing distinctly to the fact that a living pulp was in a state of inflammation. On examination I found a small round cavity on the mesial surface of the molar, which the extraction of the bicuspid had revealed. I fixed the dam on and began to excavate, when, to my surprise, I found the small opening led into a very large cavity. I broke down the crown with a mallet and chisel, and then found that the tooth was a mere shell of enamel. I wiped out all soft pulpy material, and dried off with warm air, which reduced the acute throbbing to a slight dull sensation. On carefully excavating the softened Dentine, I found a pulp exposed almost to its full extent, and in an acute state of inflammation; and further traced the decay through the distal surface, there being a cavity on this side somewhat similar to that on the mesial aspect. I accordingly broke in the enamel over it, leaving the two perpendicular walls of enamel on the buccal and palatine aspects. I now painted the surface of the pulp with two or three coats of weak solution of iodine, and dried off again with the warm air; then painted on a coat of collodion, and covered all up with a mastic dressing, and removed the dam. Patient left with a slight feeling of pain still in the tooth.

15*th*.—Renewed dressing with dam adjusted. Painted pulp again with iodine, this time covering all up with gutta-percha.

25th.—Gum a little swollen, and pain had returned slightly. Adjusted dam, and cut a cylindrical hole in the centre of the stopping, with a hot excavator, down to the pulp, which was very sensitive to touch. Inserted a dressing of creosote and tannin through the hole.

29th.—Great swelling on gum. Tongue furred, and the patient evidently in a very bad state of health. I took out the dressing, expecting to find the pulp dead. It was, however, alive, but very much inflamed. I accordingly recommended a purge, and prescribed syrup of the iodide of iron internally, leeched the gum freely, and inserted a very light dressing of creosote and tannin, previously painting the pulp with iodine.

April 14th.—Patient had taken prescription for a short time, I forget how often, and also purged herself freely. To-day she presents quite a different appearance from last time I saw her. On taking out the dressing I found the pulp in a very satisfactory condition. All pain had ceased some days previously. I renewed the dressing of creosote and tannin.

21st.—Pulp seemed quite healthy, so I filled up the hole in the centre of the filling with gutta-percha.

May 12th.—Opened up filling to see the state of pulp. Found it in a very healthy condition, and closed the hole again.

I remained at the Hospital till the end of June, and the patient did not return in the meanwhile. In November I was in London on a visit, and up till that time the porter had not again seen the patient, whom he remembered quite well. From this I may fairly conclude that the case has been thoroughly successful.

It will be observed that every time I did anything to this pulp, I previously adjusted the dam to insure perfect dryness. This I maintain is the *sine quâ non* for success in the treatment of exposed pulps.

The other case I bring forward is a striking contrast in many ways to the above. It demonstrates the inefficacy of the use of the napkin in such cases, and it also shows the beneficial results from the absolutely dry method of treatment, as also the great benefit I have derived from reading Mr. Ditcham's article already referred to.

CASE II.

July 21st, 1882.—Miss B., æt. about 23 years. Left lower 2nd molar with large cavity. No pain. Excavated tooth, keeping it dry with a napkin. Found a large pulp exposure. Capped with cork and filled with Sullivan's cement, feeling assured, as the pulp was so healthy, that all was safe.

24th.—Pain in tooth since operation. Applied a blister on gum over fangs.

28th.—Still very painful. Drilled a hole through the stopping down to the pulp, and inserted a dressing of creosote and tannin. Painted gum with Fleming's aconite and iodine.

August 2nd.—Cut out stopping, as the tooth was still very painful, and treated on the principles advocated in this paper, using a drainage tube.

8th.—Patient had had a little pain the day after the last operation, but none since. Plugged up tube with a light mastic dressing to keep out food and moisture.

11th.—Saw patient. Merely changed the dressing for cleanliness sake. There had been no pain.

21st.—All has gone on well since last operation, so I filled up the tube with amalgam. The patient was very appreciative thoughout, and took quite an interest in the success of the treatment.

Let me conclude by hoping that, if this Paper does nothing else, it may help to stay the hand of some of my brethren from that wholesale destruction of pulps which, we all know, is so prevalent at the present day.

THERAPEUTICS OF THE DENTAL PULP.

Abstract of a Paper read before the New York Odontological Society, April, 1882, *and published in the* DENTAL COSMOS.

By C. F. W. BÖDECKER, D.D.S., M.D.S., New York, N. Y.

IN the September number of the *Dental Cosmos* for 1876 there was published a paper, by Junius E. Cravens, D.D.S., of Indianapolis, Indiana, entitled "Lacto-Phosphate of Lime, Pathology and Treatment of Exposed Dental Pulps and Sensitive Dentine," in which attention was called to the injurious effects of pure carbolic acid and creasote in the treatment of exposed pulps. This article seems to have awakened the interest of several thinking minds. At the meeting of the New York State Dental Society, a few months later, Dr. W. C. Barrett, of Buffalo, read a paper on "The Use of Creasote in Treating Simple Exposures of the Dental Pulp. Is it correct practice?" This again directed my attention to the subject. Before that time I had usually capped exposed pulps with either a solution of gutta-percha in chloroform, or with zinc oxide mixed with creasote, filling the rest of the cavity with oxychloride of zinc, from which I had to record quite a number of failures. I tried to save every pulp as long as there appeared to be life. Arsenious acid, which, before I became acquainted with Dr. Wm. H. Atkinson, I had used freely, I had, like him, laid aside altogether. In July, 1879, I read the work of A. Witzel, and felt sure that every tooth treated with arsenious acid in the manner described in that work would, sooner or later, cause trouble. At the meeting of the American Dental Association held at Niagara Falls in August, 1879, I, as well as Dr. Atkinson, severely criticised Witzel's work and his advised use of arsenious acid. To-day, however, I have to corroborate some of the assertions of Witzel, and believe that without arsenious acid the dental materia medica is incomplete.

In order to make the different stages of pulpitis comprehensible, I will describe in a few words some of its most characteristic symptoms:

Inflammation of the pulp may occur in one portion or in several independent portions at the same time, or may implicate the whole organ.

It is of importance to be able, as far as possible, to distinguish the different stages of inflammation in the pulp. In a great measure successful treatment depends upon a correct diagnosis of the degree to which the disturbance has advanced; whether there is present a hyperemic condition, an inflammation involving a part or the whole of the pulp-tissue, or a dying pulp.

A hyperemic condition of the pulp exists when the patient experiences pain only when the tooth affected comes in contact with anything hot, cold, salty, sweet, or sour, etc.; the pain lasting but a few minutes, and ceasing as soon as the irritant is removed.

When a tooth is attacked by caries, or suffers from any lesion which allows the approach of an irritant near to or into the pulp-chamber, a partial inflammation, in the majority of cases, is, sooner or later, the result. Slight pain, with long painless intermissions, first occurs, but the paroxysms of pain gradually increase in length until they sometimes last an hour, the intermissions being correspondingly shortened. Pressure applied in the vicinity of the exposed pulp produces intense pain, which does not subside with the removal of the pressure. Upon the application of heat or cold the tooth aches for an hour or more, but an application of pure carbolic acid or creasote abates this. The tooth as yet is not at all sensitive upon percussion, and is as useful as before, except when, as in mastication, foreign matter is pressed upon the pulp. If the decayed portion of the dentine, which generally still covers the pulp, is very carefully removed with a sharp excavator, we observe the exposed portion of the pulp as a light-red dot, with a little blood escaping from the pulp-cavity. If such a pulp is left without therapeutical treatment, there occurs either an acute inflammation involving the whole of the organ, or, in case the pulp-cavity is largely perforated, the process may become chronic.

Inflammation of the whole pulp is characterized by very intense throbbing pain in the tooth, intermitting in the beginning, but soon becoming continuous, and which may last from one to three days. After the first or second day of the paroxysm a little sensitiveness becomes noticeable, from pressure or percussion upon the affected tooth, indicating a beginning of pericementitis. When in this stage the pulp can be brought to view, it will appear as a dark-red dot, bulging into the cavity and bleeding quite freely.

If the exposure is large the pulp may protrude from its cavity, and, the pus which is formed escaping, the organ may retain its vitality for some time, and the inflammatory process assume a chronic form. If, on the contrary, the pulp-cavity is not perforated, or the exposure is small, preventing the swelling of the pulp-tissue out of its hard inclosure, then the vessels of the pulp, and especially the afferent vessels, become engorged with blood to such an extent that they are strangulated, resulting in gangrene of the pulp. The pain, shortly before the strangulation of the vessels, is excruciating, but only for a few minutes, and suddenly it ceases altogether.

The conservative treatment of the pulp is of great importance in teeth of young persons, especially those under the age of sixteen years, where the roots are not quite fully developed. The death of the pulp in these instances frequently terminates, sooner or later, with the loss of the tooth. It is different with teeth of adults and old persons, in which cases I do not regard the loss of the pulp as a very great injury. Though I do not want to be understood to say that a pulpless tooth is as good as one that contains a healthy pulp, still I consider it safer (when filled properly) than a tooth with a pulp which is composed mainly of fibrous connective tissue, or contains large eburnifications and spicula of bone.

I have now come to the consideration of the question, Ought every exposed pulp to be saved? I should say, Certainly not. As soon as the inflammation has invaded the whole of the pulp-tissue, or the formation of the pus has commenced, such a pulp ought not to be treated and afterwards capped, but should be directly devitalized. In a hyperemic or partial inflammatory condition of the pulp, and when the latter stage has not proceeded further than the liquefaction of the gluey basis-substance in a small territory of the pulp, the organ can be saved, provided the pulp in being exposed has not been wounded deeply, or for any length of time left in contact with the fluids of the mouth or the air. Such pulps, in skilful hands, and with the proper treatment, will be saved every time, and are the only ones that promise satisfactory results after capping.

Regarding the use of pure carbolic acid or creasote in capping, I agree with Drs. Cravens, Barrett, A. Witzel, etc., that neither a hyperemic nor partially inflamed pulp, when its preservation is desired, should be treated with anything stronger than a five-per-cent. aqueous solution of carbolic acid. Pure carbolic acid is an irritant, and as such, when applied to tissues, excites inflammation just beneath the layer which it has destroyed,—a process which, in the conservative treatment of the pulp, should be prevented. In the capping of this class of pulps we require no other action of carbolic acid than that of a disinfectant, for which the five-per-cent. solution is ample. Some operators use this agent to destroy pulps, and in some instances I have done so myself. Therefore, pure carbolic acid or creasote ought not to be used in connection with anything that is designed to cover an exposed healthy or hyperemic pulp. In shallow cavities, however, which do not reach the vicinity of the pulp-chamber, I always apply pure carbolic acid for a few minutes before the filling-material is introduced. When used in this way, I regard its action as beneficial. It is a powerful disinfectant, and at the same time coagulates and mummifies the ends of the dentinal fibres. Thus the irritation of a metallic filling-material is greatly reduced. Whenever a cavity is large enough to admit of the interposition of cement and gutta-percha between the metallic filling and dentine towards the pulp-cavity, this protection should always be afforded. Since 1877 I have used directly upon the pulp no stronger aqueous solution of carbolic acid than the ten-per-cent., and lately only a solution of five per cent. So far as I know, all the pulps I have capped since 1880 are living,—that is, those teeth which I have seen since have given no trouble, and their appearance is perfectly normal. Their treatment has been as follows: When a cavity is deep, and the symptoms indicate that the pulp-cavity is very nearly or slightly perforated, I at once apply the rubber dam, if possible, and saturate the cavity with the five-per-cent. solution of carbolic acid. I then excavate and clean the side walls of the cavity perfectly before touching the vicinity of the pulp-chamber. If pain is produced by slight pressure with a piece of cotton upon the softened dentine covering the pulp (indicating a perforation of the pulp-chamber), I very carefully remove, with a sharp and large excavator, as much of the disintegrated dentine as possible, but without quite exposing the pulp, and apply the cap. If upon slight pressure into the cavity the patient experiences but little or no pain, I remove all the decay from the cavity. The best material to be placed upon the dentine, either soft or hard, covering the pulp, as well as upon an entirely bare organ, I have found to be zinc oxide mixed to the consistence of thick cream with an aqueous five per cent. solution of carbolic acid. Over this, before it commences to dry, I very carefully place a thin wafer of gutta-percha, which, previous to its introduction into the cavity, I moisten with the carbolic acid solution. After three to five minutes, I cover the cap with either oxychloride of zinc or carbolic acid cement (Witzel*). When sufficiently hard, I

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* The formula for Witzel's carbolic acid cement is as follows:

℞ Acid carbol., 5·0;
Alcohol absol., 2·0;
Aq. dest., 40·0;
Glycerinæ, 20·0.

Mix, and add an equal volume of the zinc chloride used in preparing oxychloride use oxyphosphate or amalgam to fill up the rest of the cavity. The latter filling I always expect to remain for at least one or two years before I would consider it safe to fill such a cavity with gold.

When myxomatous connective tissue is attacked by an inflammatory process, this, as all other tissues, returns to its medullary condition, from which, as long as the single medullary elements are connected with one another, a fibrous cicatrical tissue, bone, or dentine may arise. This tissue can never again return into the myxomatous condition, and consequently, in some instances, when spicula of bone or dentine are developed in the pulp-tissue, severe disturbances may occur. For this reason I advocate the devitalization of pulps, the whole tissue of which has, by inflammation, either wholly or to a great extent retrograded into its medullary condition.

On the 1st of June, 1878, I inserted for Dr. H. an oxychloride filling in the right upper first molar, which had previously been filled with amalgam. The cavity was large, involving the distal and grinding surfaces, with half of the lingual wall broken off. On the 21st of August, 1880, I restored the last portion of the tooth with gold, but left much of the oxychloride cement over the pulp-cavity. The walls of the cavity were quite sensitive under the bur, so much so that my patient, who in all other operations I had previously performed for him never said a word of the pain produced by excavating, in this instance remarked that the drilling in some places was very painful. There had been no pain in the tooth whatever previous to the introduction of the gold, but about a week after the operation was completed the tooth became sensitive upon percussion and mastication, without signs of pulpitis. About two weeks later my patient was suffering from an alveolar abscess situated above the buccal roots of this molar tooth. I immediately tried to open the pulp-chamber, but could only go a little way into the dentine, when the patient informed me that the drilling caused him severe pain, which was analogous to the excavating of a sensitive tooth. I abstained from drilling any further, filled the small hole with gutta-percha, and began the treatment of the abscess through the gum at the buccal surface, but with no success. The abscess was continually discharging until the beginning of December, when I removed the gutta-percha, and, with a sharp drill, perforated the pulp-chamber, but, to my surprise, found the pulp alive and bleeding freely. I then, as quickly as possible, capped the pulp in the usual way, and filled the

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fillings. To a sufficient quantity of this mixture add oxide of zinc to give it the necessary consistence for filling.

This author also mentions a varnish composed of collodion, gutta-percha, and a little carbolic acid, which he applies upon an exposed pulp previous to the adaptation of the cap. This I have found very serviceable.

outer portion of the drill-hole, which had been widened with a larger bur up to the cap, with oxyphosphate cement, concluding to wait a few weeks longer, and then, if the abscess did not heal, to devitalize the pulp. On the 23rd of January, 1881, I removed the filling, together with the cap, in order to destroy the pulp, but found that the pulp had died recently, as there was no smell of putrefaction present in the pulp-chamber. I took out a large filling in the mesial surface of the tooth, and from this situation thoroughly exposed the pulp-chamber, from which I extracted a very large so-called "pulp-stone" of the size of a small pea, occupying the neighbourhood of the buccal roots. The canals of the tooth were then examined, and I found the two buccal canals in a very putrid condition, but the lingual canal contained its recently-dead portion of the pulp without large calcified or eburnified masses. After the disinfection and filling of the pulp-canals the abscess began to heal, and the tooth to-day is as serviceable and comfortable as any other tooth in the mouth.

A few years ago I tried to save every pulp, even after an acute total inflammation had been present, treating them with every suitable remedy, but cautiously avoiding arsenious acid. Many times I have rather let my patient suffer a great deal of pain than devitalize the pulp in the usual manner. Such practice to-day I regard just as one-sided as to try to fill every cavity with gold, and adhere to the opinion that nothing but that material will be able to save teeth from decay, and *vice versâ* of other filling material. I have experimented with arsenious acid in quite a number of cases, but am not quite ready yet to say anything about them. This, however, I can state, that so far as I know I have met with the same results as described by Witzel, namely, that arsenious acid applied upon a healthy or a superficially inflamed pulp (for from twelve to twenty-four hours), which has previously been treated with a solution of tannin in carbolic acid, does not devitalize the whole of the pulp, and when after twenty-four hours the arsenious acid, together with the destroyed portion, is removed, the remainder of the pulp, which appears to be quite healthy, can be capped and preserved. As this subject is of very great interest, I will give a very brief abstract of the method as published by Witzel in "Die Antiseptische Behandlung der Pulpakrankheiten des Zahns" (Berlin, 1879):—

"Before excavating I insert a piece of spunk moistened with the carbolic acid and tannin solution into the carious cavity for a few minutes, clean the surrounding gum of the mucus-like saliva with a soft brush or a piece of spunk, and make the cavity accessible. And now I begin to clean the cavity either with broad spoon-shaped excavators or sharp oval burs. Before the introduction of the arsenious acid I make an application of the carbolic-acid-tannin solution,* until the pain in the tooth has entirely ceased, which is generally the case in five or ten minutes. The arsenious acid and morphine made into a thin paste is then laid directly upon the exposed pulp, and the cavity hermetically sealed. If the coronal portion of the pulp is to be amputated and the stumps preserved, this application should not remain longer in the tooth than from twelve to twenty-four hours. If, however, the whole pulp is to be extracted, the arsenious acid paste should remain in the tooth for forty-eight hours. Before the removal of the whole dressing the cavity must be moistened with a weak solution of carbolic acid. Then take a sharp new bur, with the engine, now remove the last dressing, and with a few quick revolutions of the bur amputate the coronal portion of the pulp, and immediately fill the cavity with carbolic acid solution until the bleeding has ceased; then place a piece of spunk moistened with the carbolic-acid-tannin solution over the amputated stumps. The amputation of a portion of the pulp is to the patient somewhat uncomfortable—about as painful as exposing a pulp. With very sensitive patients I make an application of a solution of iodine with carbolic acid previous to the amputation for about a quarter of an hour, which makes the operation painless. The whole treatment must be done quickly, very cleanly, and without exposing the amputated stumps much to the action of the air. The cavity is now to be syringed out well, dried, the stumps touched with carbolic acid, mastic, and pulp-varnish, and quickly capped with carbolic acid cement; then a layer of oxychloride and gutta-percha is placed over it, and, lastly, the rest of the cavity is filled either with amalgam, oxyphosphate, or other material."

Since December last I have tried a new remedy (iodoform), which of late has been reported as doing great wonders in surgery. The very disagreeable smell of this drug had prevented me from using it before. In a German dental journal (*Vierteljahrsschrift für Zahnheilkunde*) I noticed an article on iodoform by Dr. Julius Scheff, of Vienna, who has been very successful with it in capping slightly inflamed pulps, using it in the form of a paste, the formula of which was original with Dr. Paschkis, and is as follows:

℞ Iodoform pulv.,
Kaolin pulv., āā 4·00;
Acid carbol. cryst., 0·50.
Mix; add sufficient glycerin to form a paste; then add ol. menth. pip., gtt. x.

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* ℞ Acid. carbol., ·150;
Tinct. aconit rad.,
Aq. menth. pip., āā ·050;
Glycerinæ, ·020;
Acid. tannic., ·030;
Ol. menth. pip.,
Ol. caryophylli, āā gtt. xxv.—M.

I have tried this paste in a small number of exposures, and apparently with good results. I placed the iodoform paste over the exposed pulp, covering it with a wafer of gutta-percha and a layer of carbolic acid cement, and filled the rest of the cavity with either gutta-percha or oxyphosphate of zinc. None of these teeth have given any trouble since then; but in what state their pulps are I am unable to say at present. I have found another very valuable use for iodoform, in chronic alveolar abcesses. For this purpose I use the saturated solution in sulphuric ether, which, when forced through the end of the affected root into the old abscess, acts, I believe, as a very powerful disinfectant, and is, therefore, of great service as an application previous to filling the roots of pulpless teeth. I have also used the solution of iodoform in ether as an injection into the antrum, the mucous membrane of which was inflamed. In this case it did not quite stop the formation of pus, but prevented it longer than any of the other agents which, in this case, I had used previously or intermittingly.

THE DIFFUSION OF BACTERIA.

THE researches of M. Pasteur and Darwin have shown how earthworms may aid the diffusion of small organisms, some of which may produce disease. Professor Schnetzler states that the dejections of earthworms always contain numerous living bacteria and their germs (the hay-bacterium included). It is clear that bacteria in enormous quantity float in the air about us; and we have at easy command, Professor Schnetzler points out, a small apparatus traversed by about 8,000 cubic centimetres of air per minute, which may inform us as to those floating germs. This is no other than the nasal cavity, on the mucous surface of which air-particles are deposited. To observe these he advises injecting the nose with distilled water (completely sterilised) by means of a glass syringe previously calcined. The liquid so obtained is put in one perfectly clean watch glass and covered by another. With a microscope magnifying 700 or 800 one finds, among various particles in the liquid, some real live bacteria. If the liquid be kept a few days in a clean glass tube hermetically sealed, the bacteria are found to have increased very considerably. One sees *Bacterium termo*, *vibrio*, *spirillum*, *bacillus subtilis*, even some *infusoria*, and spores and fragments of fungi. Professor Schnetzler has further successfully cultivated the organised germs by means of a mixture of gelatine and distilled water. Why do not those bacteria in the nasal cavity always multiply and develop and penetrate to the windpipe and lungs? Their progress is doubtless opposed by the vibratory movements of cilia (or minute hairs) in the air-passages, and the weakly alkaline reaction of the nasal mucus may (it is also suggested) be unfavourable to some of them. Colin has proved that bacteria producing acid fermentation perish in liquids with alkaline reaction. Infectious bacteria may, however, multiply to a formidable extent on living mucous surfaces, witness the growth of the *micrococus* of diptheria, brought by the air into the air-passages; also the *bacterium* of anthrax. The *bacillus* of tubercle, as Koch as lately shown, may be transmitted from one person to another by the air-passages. Professor Schnetzler thinks hay fever may also be due to bacteria entering the nose. While the development of. bacteria on normal mucous surfaces is usually limited, millions of them are found in the dejections of healthy children.—*World of Science.*

THE FUNCTION OF SECRETION.

Being part of the Opening Address before Section D—Biology—of the British Association, by

ARTHUR GAMGEE, M.D., F.R.S., &c.,

President of the Section.

HAVING brought before you the most salient facts with which we are acquainted, which appear to throw the most light upon the general physiology of glandular secretion, I wish, before concluding, to speak of the theoretical views which have been advanced in explanation of a large number of the facts.

In the first place, I have to confess that our ignorance is absolute as to the cause of the specific endowment of different secreting cells, in virtue of which they produce new bodies at the expense of certain of the materials supplied to them by the lymph, or separate particular constituents from the lymph, to the exclusion of others which are equally abundant in the liquid. We express the full measure of our ignorance when we state that the difference in function of different gland cells is due to differences in endowment of the protoplasm of the cell, which in no case is explained by any objective characters of the cell.

The phenomena of the secretion of water, which forms so large a part of every secretion, have given rise, however, to numerous speculations, concerning which I may make a few remarks.

The primitive view that the glands are organs in which is strained off from the blood water holding certain substances in solution has, in a modified manner, found favour with some even to our own days, and appears indeed, at first sight, to be borne out by certain facts. Thus within wide limits the amount of water secreted by the kidney depends upon the pressure of blood in the glomeruli. Any circumstances which will lead to an increase of pressure in these vessels (as increase of blood pressure generally, division of renal nerves, division of the splanchnics, especially when combined with stimulation of the spinal cord), by dilating the branches of the renal artery, will lead to this result. At first this would seem to show that the process of separation of water, in the kidney at least, is but a process of filtration, though a remembrance of the famous experiment of Ludwig, referred to at an earlier period, on the relation between the pressure of secretion of saliva and that of the blood in the arteries, would impose caution in drawing the conclusion. What are the facts, then, relating to the blood pressure in vessels in other organs of the body, and the transudation of liquid from them?

If an increased arterial pressure led *ipso facto* to an increased transudation through the capillary walls, it would follow that the amount of lymph and the pressure of the lymph-stream would rise with the rise of the arterial pressure, but direct experiments on this matter have led to an opposite conclusion. The experiments of Paschutin and Emminghaus, carried out under Ludwig's direction, have shown that when the arterial pressure in the extremities is increased, there is no corresponding increase in the lymph produced. Again, when the chorda tympani is stimulated in an animal into whose blood atropia has been introduced, the vascular dilatation which is produced, and which is then unaccompanied by secretion, does not lead to an increased production of lymph, which would make itself evident by the gland becoming œdematous. How then are we to account for the flow of water through a gland? By ascribing it to an influence which is exerted by the gland cell, in the first place, upon the liquid which environs it, viz., the lymph. And accordingly, even in the case of the glomeruli of the kidney, we conclude that the water is separated as a direct result of the activity of the layer of transparent epithelium cells which cover them. Hering has advanced a strictly physical theory, which would account for the mode in which certain cells exert this influence, by supposing that there is produced within them bodies which, like mucin, have a great affinity for water and which then pass into the secretion; and which therefore lead to a current of water passing through the cell; but the theory is one which cannot be admitted, because, as Heindenhain points out, the passage of water through a gland occurs in cases where there is no constituent in the cells, at all resembling mucin in its affinities or behaviour towards water.

I feel inclined to say that the speculations, necessarily indefinite though they are, of Professor Heindenhain afford the best explanation of the phenomena. Heindenhain starts from the fundamental fact that during secretion only as much water passes out of the blood-vessels of the gland as appears in its secretion, seeing that, however long the process of secretion may continue, the gland never becomes œdematous, nor does the current of lymph from it increase.

The volume of liquid filtered through the blood capillaries adjusts itself exactly to the volume of liquid separated by the cells. This equality in the amount of liquid secreted and filtered appears only explicable on the supposition that the act of secretion is the cause of the current of water—in other words, that the water which the cells lose in the formation of the secretion generates changed in them which can only be compensated for by an abstraction of water from the immediate environment.

Within certain limits, Heindenhain continues, we may form purely physical conceptions of the process. We may conceive, for instance, the whole protoplasm of the cell to have a certain affinity for water. The cells at their contact with the basement membrane may be supposed to be able to abstract water from it; the loss which the membrane sustains will be made up by the lymph, and this again will influence the blood in the capillaries.

The passage of water into the cells will go on until a period of equilibrium is attained; but at that time the current of water from the capillaries through the lymph to the cells will cease. We may conceive further, reasons Heindenhain, that the passage of water out of the cell is hindered by such obstacles to the process of filtration as are represented by resistance opposed to it by the superficial border layer of protoplasm. If we now conceive that, for example as a result of nerve stimulation, the gland cells pour out water, the condition of equilibrium which existed between cell, basement membrane, lymph, and capillary will be disturbed, and a current of liquid set in from the last to the first, and continue as long as the activity of the cells continues.

It is not difficult moreover, Heindenhain remarks, to form physical conceptions of the processes whereby water may be separated from the cell itself. It is conceivable, for instance, that the protoplasm of the cell may contract after the manner which occurs in many infusoria, and which in them leads to the accumulation of water in droplets, forming vacuoles, except that in the case of the secreting cells the water is poured out on the outside and not on the inside of the cells. Or, again, it is possible that on the gland cell passing into the condition of activity an increased production of CO_2 may occur, leading to an increased diffusion of water outwards.

So far, I have quoted Professor Heindenhain, for the most part in his own words. Let me add, however, that the two hypotheses which he advances as possible explanations of the mechanism of secretion of water by the cell rest upon the most probable grounds, as upon the presence of the intra-cellular protoplasmic network which has been so beautifully demonstrated by recent researches, and especially by those of Professor Klein; or, again, upon the fact, proved by the analyses of Professor Pflüger of the gases of the saliva, that there is during secretion great production of CO_2, as shown by the amount of this gas in the saliva being much greater than in the blood, and upon the fact of the remarkable diffusibility of acid solutions.

Reasoning upon a large number of facts, which I have not time to refer to, Professor Heindenhain has come to the conclusion that, quite apart from the nerves which control the vascular supply to a gland, there exist two distinct sets of nerve-fibres in relation to the glandular elements. The first of these, which he terms "secretory," when stimulated, lead to the secretion of water and saline constituents; the second, which he terms "trophic," influence the transformations of the protoplasm of the cell, and thus affect the organic constituents of the secretion.

I do not wish to pronounce a definite opinion concerning this hypothesis, but would remark that the nomenclature proposed by Heindenhain appears to me to be an unfortunate one, especially because it attaches a new meaning to a word which had previously been used by physiologists in a different sense. I refer to the adjective *trophic*, which has always implied "governing nutrition." It appears to me almost inconceivable that if there exist two sets of secretory nerves, the action of each should not profoundly affect the nutrition of the cell protoplasm, though, of course, it is conceivable that they should do so in very different manners.

General Conclusions.

The complicated studies, of which I have attempted to give you a brief sketch, have led to our forming certain clear general conceptions in reference to the process of secretion. They have brought into greater prominence the dignity, if I may use the expression, of the individual cell. The process of secretion appears as the result of the combined work of a large number of these units. Each, after the manner of an independent organism, uses oxygen, forms CO_2, evolves heat, and derives its nutriment from the medium in which it lives, and performs chemical operations of which the results only are imperfectly known to us, and which depend upon peculiar endowments of the cell protoplasm, of which the causes are hidden from us. So long as the protoplasm is living, the gland cell retains its power of discharging its functions, and in many cases does so, so long as the intercellular liquid furnishes it with the materials required. In some cases, however, the gland cells are specially sensitive to a variation in the composition of the nutrient liquid, certain constituents of which appear to stimulate the protoplasm to increased activity. In the higher animals the cells, particularly in certain glands, are in relation to nerves which, when stimulated, affect in a remarkable manner the transformations of their protoplasm, leading to an increased consumption of oxygen, an increased production of carbonic acid, an increased evolution of heat, and an increased production of those matters which the cell eliminates and which constitute its secretion.

This historical survey of the growth of our knowledge of the process of secretion exhibits the characteristic features of biological advancement. Comparative anatomy has been the foundation of observation of facts and physical experiment, the road to physiological research. At various stages the value of hypotheses has been well illustrated, and, whenever they have had to make way for the broader and truer interpretations suggested by the accumulation of facts and greater precision of observation, it has been demonstrated that the process of observation is not one of simple sight but of complex ratiocination.

MEDICAL ACTS COMMISSION.

In the July number of the *Dental Record*, we intimated that the Royal Commissioners appointed to inquire into the Medical Acts had just issued their Report. We are now able to reproduce the evidence bearing upon Dental politics, which was given before the Commissioners, by Mr. John Tomes, F.R.S., President of the British Dental Association; Mr. T. Edgelow, President of the Association of Surgeons, Practising Dental Surgery; and Dr. R. Quain, Member of the Medical Council.

The Commissioners were—The Earl of Camperdown (Chairman); The Bishop of Peterborough; The Rt. Hon. W. H. F. Cogan; The Master of the Rolls; Sir Wm. Jenner; The Rt. Hon. G. Sclater-Booth; John Simon; Prof. Huxley; Dr. Robert McDonnel; Prof. Turner; James Byrce.

John Tomes, F.R.S., M.R.C.S., L.D.S. Eng., examined.

Chairman.—You are a Member of the Royal College of Surgeons and a Fellow of the Royal Society?—Yes.

And you appear here to represent the views of the British Dental Association?—Yes.

Would you kindly inform us of the aims of that Association and the number of its members?—The particular aim of the Association is to offer active assistance in carrying out the spirit and letter of the Dentists Act, and also to encourage scientific investigation by the reading of papers and the kind of meetings usual with societies of a scientific character.

Does your Association meet frequently?—We have annual meetings. The Association is represented by a large representative board, consisting of upwards of forty members, which meets at least four times a year, and if occasion requires more frequently; and, moreover, we publish a monthly journal. The aims of the Association are shown in the following extract from the Memorandum of Association:—

"The objects for which the Association is established are the promotion of Dental and the allied sciences, and the maintenance of the honour and the interests of the Dental Profession, by the aid of all or any of the following:

(*a.*) Periodical meetings of the Members of the Association, and of the Dental Profession generally, in different parts of the country.

(*b.*) The publication of such information as may be thought desirable, in the form of a periodical journal, which shall be the journal of the Association.

(*c.*) The occasional publication of transactions or other papers.

(*d.*) The grant of sums of money out of the funds of the Association for the promotion of the Dental and the allied sciences in such manner as may from time to time be determined on.

(*e.*) The maintenance of the spirit and provisions of the Dentists Act by such lawful means as may be necessary.

(*f.*) The encouragement of the Dental Benevolent Fund for the relief of decayed or necessitous members of the Profession.

(*g.*) And such other lawful things as are incidental or conducive to the attainment of the above objects."

What practical steps have you taken towards assisting in carrying out the Dentists Act?—We have from time to time furnished information to the Medical Council which is entrusted with the carrying out of the Dentists Act.

Do you maintain any direct relations with the General Medical Council?—No further than as an organisation devoted to promoting the education of Dentists, and also, as I stated before, to assist in carrying out the spirit and letter of the Dentists Act as an educational measure; but we have no authority beyond the authority of an Association which is incorporated, just as the British Medical Association is under the same conditions an incorporated association.

What kind of assistance do you render to the Medical Council?—By furnishing them with such information as may come to our knowledge; I may give you an instance. We brought before their notice a Dental curriculum which had been in operation in the College of Surgeons of England under its Dental Charter, and we urged that that, a tried curriculum, should be as nearly as possible followed by the Colleges of Surgeons of Ireland and of Scotland which were authorised to grant diplomas in Dental Surgery under the Dentists Act.

Do you happen to know whether your recommendations were adopted by the Medical Council and urged by them on the other bodies?—The Medical Council adopted a curriculum in all essential particulars similar to that which we urged for their acceptance.

Has that curriculum been generally accepted?—It is accepted by the four licensing bodies in Dental Surgery.

Then so far as the experience of your Association goes, the Medical Council has in this respect been of great use in promoting the best interests of Dentistry?—My experience, and I think the experience of the body I represent, is that great good has been effected by the Medical Council in carrying out the Dentists Act, subject to one or two exceptions which perhaps we may come to afterwards: but they are exceptions that have no relation to the action of the general body of the Medical Council, but rather bear upon an imperfect organisation. That imperfection of organisation is the main subject that I wish to bring before the attention of the Commission.

Is it your experience that the Associations of Dentists or the Colleges of Dentists have been backward in accepting the recommendations of the Medical Council in any portion of the kingdom?—No, I think that the licensing bodies, the four Colleges of Surgeons, to which I presume your Lordship refers, and to which I have alluded before, have all accepted the recommendations of the Medical Council.

Is it your opinion that the colleges accept the recommendations of the Council with the more readiness because they are merely recommendations, and are not set forth with any actual authority?—I am quite unable to answer that question.

I think you have not told us approximately the number of members of your Association?—About 420, of whom 40 are qualified as medical practitioners, and 250 licentiates in Dental Surgery.

Is your Association mainly for London, or does it extend to the provinces?—It is for the whole of the United Kingdom.

Are there any other associations of Dentists of a similar kind to your own?—I do not know of any association of a similar kind. There is a small association who call themselves "The Association of Surgeons Practising Dental Surgery." They do not, to my knowledge, publish a list of members, but when the Dentists Act was before the House of Commons there were not more than about 100 persons who held a licentiateship in Dental Surgery conjointly with a strictly medical qualification, or who practised Dental Surgery under a medical qualification only; of that supposed 100 (and I do not think there were so many) I think 91 petitioned Parliament, and 68 memorialised Members of Parliament individually, in favour of the Dentists Bill, and we have their names.

(*The witness handed in a copy of the petition to Parliament, and of the memorial to individual Members of Parliament.*)

The petition approving the Dentists Bill was signed by upwards of 1,100 Dental practitioners, viz., by—

Dental practitioners who are licentiates in Dental Surgery only of the Royal College of Surgeons of England	184
Dental practitioners who are licentiates in Dental Surgery, and also qualified medical practitioners	42
Dental practitioners who are licentiates in Dental Surgery and hold English and foreign medical qualifications also	2
Dental practitioners who are qualified medical practitioners only	28
Dental practitioners who hold foreign medical qualifications only	17
Dental practitioners who are qualified medical practitioners, and hold foreign Dental qualifications	2
Dental practitioners who do not hold any qualification	895

The following is a copy of the memorial to individual Members of Parliament:

Dental Practitioners Bill.

SIR,—The principle and object of the Bill now before Parliament is simply this: That a person shall not hold himself out, by the use of a distinctive title, as possessed of a special qualification to practise Dental Surgery, unless he has actually qualified himself; subject, however, to a full recognition of all existing rights and privileges.

We being ourselves Fellows and members of the Royal College of Surgeons of England, or other similar bodies, therefore venture to ask your support for the "Dental Practitioners Bill," which has been considered with very great care, and is submitted to Parliament with the concurrence and support of the most eminent members of the Surgical and Dental Professions.

We are, Sir,

Your obedient Servants,

(*Here follow the names of* 68 *qualified medical practitioners practising Dental Surgery.*)

They did not all petition?—I cannot tell you, inasmuch as the Association of Surgeons practising Dental Surgery have never published a list of their members. We know that a number of men have left them and joined our Association, but they publish no minutes or transactions.

The British Dental Association, I may take it, is generally speaking in favour of the Dentists Act of 1878, is it not?—Necessarily. They are bound by their Articles of Incorporation, by the rule that I mentioned, and it is one of the Articles of Incorporation that they shall support the Dentists Act.

And they conceive that it is in the true interest of the Dental Profession that it should be associated with the medical profession through the agency of the General Medical Council ?—Yes, I have never heard any difference of opinion upon that subject.

The Dentists, as such, have no special representation, I believe, on the General Medical Council ?—No, they have no representation further than this, which is a very partial one. The surgical corporations are represented, and the more educated portion, if I may use that expression, the diplomaed portion of the Dentists, are licentiates in Dental Surgery of this or that College ; and it may be rightly presumed (and it has been shown to a certain extent that such is the fact) that the representatives of those colleges take a considerable interest in the respective Dental departments. Sir James Paget has on many occasions shown at meetings of the General Medical Council, and of the College of Surgeons, that he was fully acquainted with all the details of the working of the Dental department of the College of Surgeons, and took a strong interest in it ; but we have no direct representation.

And Dentists, as such, do not vote in any of the corporations which return members to the Medical Council at the present time ?—They do not ; they are simply licentiates in Dental Surgery of this or that corporation. That is the title given them by the Dentists Act. In this connection it may be stated that the Royal College of Surgeons, England, under its Dental Charter of 1859, has, since that date, had a Board of Examiners in Dental Surgery composed of surgeons and Dentists in equal numbers, that the Council of the College referred Dental questions to this Board, the report of which thereon has been, I believe, usually adopted and acted upon by the Council ; and it may be further stated that this course of proceeding on the part of the College has been attended with very satisfactory results as respects the education and examination of Dentists.

Is it the opinion of your Association that you ought to be represented more directly on the General Medical Council ?—The object of my presence here is to plead for a certain degree of representation, supposing any change is made in the constitution of the Medical Council ; but I do not come here on behalf of my associates or myself to make any complaint against the Medical Council as such. Whenever I speak of it I have occasion to speak of it in precisely opposite terms to those of complaint. But the reason that we desire representation is, that we have seen from time to time that the Council has not been sufficiently informed upon strictly Dental matters when considering them, and if your Lordship desires it I think I can make good my case.

Can you shortly point out to us an instance ?—Some little time since the Association sent in to the Medical Council a list of names of something like 400 persons, whom on high legal authority the Association believed to be wrongly registered, that is to say, that these persons had no right of registration. The Act requires that a person shall be *bonâ fide* engaged in the practice of Dentistry separately or in conjunction with medicine, surgery, or pharmacy. In the cited cases those persons, although they had returned themselves as pharmacists, or as practising Dentistry with medicine and surgery, had no right whatever to practise either the one or the other. We sent in proof of this allegation, and their names were not to be found in the Chemists' and Druggists' Register or in the Medical Register ; and those persons only have a right to practise medicine who are registered in the Medical Register, or to practise pharmacy who are registered in the Chemists' and Druggists' Register. The Medical Council had in the meantime taken the opinion of Mr. Charles Bowen (now Mr. Justice Bowen) as to how this phrase should be read ; and although we have not seen that opinion, yet it is not contradicted that it coincided, I am not in a position to say in all its details, but mainly, with the opinion that we sent in from Mr. G. A. R. Fitzgerald, the draughtsman of the Act. The cases of these 400, with the two legal opinions, were referred by the Medical Council to its Dental Committee, which Dental Committee is empowered by the Act to ascertain the facts of such cases, and their decisions upon the facts, so far as the Medical Council is concerned, is final. It does not appear that the Dental Committee have the power of determining what shall be the law applicable to the cases. The Medical Council was summoned last February to receive the report of this Dental Committee, and then to our utter astonishment, on the day of the meeting, we found that in that report no mention was made of Mr. Justice Bowen's opinion or of Mr. Fitzgerald's, but a wholly new opinion, obtained from Sir Farrer Herschel and Mr. Muir Mackenzie jointly, was substituted, which opinion completely traversed the opinions that had been sent in to the Committee by the Medical Council. Had there been a Dentist on that Committee, I feel sure that that Dentist would have remonstrated very strongly against the introduction of a perfectly fresh opinion without any reference whatever being made to the pre-existing opinions. I think that he would have had grounds of complaint had not that remonstrance been acceded to. Moreover, we who sent in the names were not appealed to to substantiate our charge, or appealed to in any way whatever, although the Committee had full power to call in our assistance, and to ask if we had any additional information to afford, and we could have given them a great deal of information. But in the absence of any one on the Committee who knew what the nature of the information might be, it was not sought. Then, when the matter was discussed before the Medical Council itself, Dr. Quain said "that the Dental Committee found there had been no fraud in any one case referred to by them." Now, what would have been pointed out, had there been a Dentist on that Council, would have been that, of the names sent in, something like 70 or 80 had withdrawn from the Register voluntarily, and as many had declined to answer any questions or to take any notice of the letters addressed to them by the solicitor on the part of the Council. I think had there been a Dentist on the board, that fact would have been pointed out. Then again, a considerable number of persons had registered themselves as in practice before the passing of the Act, who had registered themselves in the Chemists' and Druggists' Register, and who had passed in pharmacy subsequently to the passing of the Dentists Act, so that their declaration was incorrect; and I think that that wrong would have been exposed and time asked for further consideration had there been a Dentist on the Council.

Then, I think I may take this from you, that you do not complain that in this instance the Medical Council neglected you, but what you feel is that if the Dentists had had a special representative upon the Medical Council he would necessarily have been on the Dental Committee, and he would have put new facts before the Dental Committee, and afterwards before the Medical Council, which as you think were not brought before them, and which you think would have exercised a very important influence upon their decision?—Yes. When the matter was under consideration, Dr. Quain defined Dentistry as consisting of merely pulling out teeth, to which stopping and scraping teeth had now been added. He might with as much accuracy have defined ophthalmic surgery as merely taking out eye-balls. He gave that definition in supporting the retention on the Register of a certain number of hairdressers who had occasionally drawn teeth, but who admitted that they knew nothing of anatomy in any form whatever. I think that definition of Dental practice would have been corrected. The upshot of it was, that the Council passed a resolution to the effect that there was not sufficient evidence to justify the removal of the cited names. On the strength of that decision, and under legal advice, we laid a case before Sir John Holker, Mr. R. S. Wright, and Mr. G. A. R. Fitzgerald, a case very carefully drawn up, and we submitted as part of the case the opinion of Sir Farrer Herschel and Mr. Muir Mackenzie, and asked for their joint opinion. The consultation resulted in an opinion precisely opposite to the one accepted and acted upon by the Council, *i.e.*, an opinion to the effect that the persons whose names we cited had no right to be on the Register. Now, if a Dentist had been on that Committee, and had had the power of speaking and of voting at the Council, some such course as the one we subsequently followed would have been proposed at the time, and the Council would have been asked to defer its decision until the legal difficulty had been cleared up. As it was the Council decided upon, and were forced as it were to accept, the ruling of the Committee, not only in respect of the facts of the cases, but in respect of the law applicable to them. In further illustration of the want of special information on the part of the Medical Council I may mention that a counsellor at the last session said, " He thought they (Dentistry and Dental Surgery) were different things," whereas the former term, of recent American parentage (since 1842), has been used from the first as a short substitute, without any difference of meaning, for the longer and more expressive term of Dental Surgery. In this sense it is used in the Dentists Act, the two terms having been introduced therein for the purpose of alternative use, and for the avoidance of any difference of meaning.

You are evidently of opinion that it would have been of very great advantage on that occasion, and possibly on several others, if there had been a special repesentative of the Dental Profession on the General Medical Council; would you kindly point out to me what you consider the best form of medical council so far as the Dentists' Profession is concerned?—My own feeling would be in favour of two Dentists rather than one being appointed (either by the educated Dentists, that is to say, by the licentiates in Dental Surgery, or preferably perhaps by the Privy Council), whose duty it should be to attend the Council on all occasions whenever any Dental questions arose, and that they would in that position be rendered responsible for conveying to the Council whatever information was necessary in respect to the wishes and necessities, educational and otherwise, of Dental practitioners. I am not in a position to say which would be the better form of election; I have no authority to do so from the Society that I represent; but I think that supposing the attendance of the persons so elected were limited to the occasions when Dental questions were under consideration, it would not be an unreasonable thing that there should be at least two, and for this reason, that if the Privy Council appoint, they might appoint unwittingly a person who is very incompetent; but there is a far better chance of securing effective assistance if they appoint two than if they appoint only one. The same holds good with reference to an appointment made by the licentiates, the most noisy man might get in, but if two were elected the chance of satisfactory representation would be greatly bettered.

Then you would be in favour, in short, of there being two direct representatives of the Dental Profession upon the Medical Council ?—I should be in favour of there being two representatives on the Medical Council, nominated by the Crown, or elected by the licentiates, the attendance being limited to Dental business.

Might it not be suggested that this member was placed in rather an inferior position as compared with other members of the Council if he were informed at the time of his election or nomination that his attendance was only required on certain specific occasions ?—I think that as a Dentist's education is special and general, estimated at three-fifths general and two-fifths special, the Dentist is already well represented in respect to his general education ; and what we want there is information as regards his special conditions and requirements, educationally and otherwise.

In proposing that there should be two direct representatives of the Dentists on the General Medical Council, have you taken into consideration what the total number of the Medical Council would be ; are you making that proposal of two Dentists with the idea in your head that the Council will continue to consist of twenty-four ?—I have no knowledge of that kind. I make the recommendation of two, because if there were one he would be as far as the Dentists were concerned despotic, and he might be a bad despot.

And he might also possibly be absent when wanted ?—He might.

With regard to the question of infractions of the Dentists Acts, and how far those infractions are or ought to be dealt with by the Medical Council, does your Association take any cognizance of the infractions of the Dentists Act, *e.g.*, the assumption of titles to which the persons taking them have no right, such, for instance, as that of "Dentist Surgeon" by a person who has no connection with the College of Surgeons ?—It has been judicially settled already by the Court of Queen's Bench, in January, 1860, that you cannot impose any restriction upon the use of the title of Dental Surgeon until you come to a fresh race of men, and the fresh race of men are Dental Surgeons in virtue of their being licentiates in Dental Surgery. Hence it has been held that those registered persons who are already in practice, and who were in practice before the Act, could not be dealt with penally in respect of the question of title.

Then you think that in so far as the Dentists are concerned, there are no means of enforcing the penal clauses of the Dentists Act ?—No, in respect to the use of titles by registered persons, the point has been tried in the Court of Queen's Bench, and there thoroughly discussed, and has with a like result been very frequently discussed since that time, namely, by the Medical Council, by the Parliamentary Bills Committee of the British Medical Association, and by Parliament, when the Dentists Bill was in committee.

Is there anything else that you wish to put before the Commission? —In answer to your previous question I may state that the Association would prosecute a person who assumed the title of Dentist who was not on the Register; but before they can prosecute they must in each case go to the Medical Council and ask its consent.

That is because the prosecutors are the Medical Council, I suppose? —No; it was supposed that there might be some oppression exercised, to guard against which this provision was insisted upon by the Government. Supposing that we find an unregistered person calling himself a Dentist, we must state the case to the Medical Council, and gain its assent before we can bring an action against that person.

That is under the provisions of the statute?—Yes; and if any alteration were made it would be very desirable that it should be made clear that the executive committee of the Medical Council should be able to give such power, because the Medical Council meets only once in a twelvemonth. A branch council can give such power, but a branch council perhaps only meets once in a twelvemonth. So that it is very desirable that the executive committee should be able to empower us or any other persons to prosecute an individual who calls himself a Dentist or a licentiate in Dental Surgery, he not being registered as either the one or the other. The Register records the nature of the Dental qualification, that is, whether it be the possession of the licentiateship in Dental Surgery, or rests on the fact of having been "in practice before July 22nd, 1878," and will in future record also any surgical qualification held by the registered person.

Mr. Simon.—You referred to an occasion on which the course taken by the General Medical Council seemed to your Association unsatisfactory, owing, as I understood you to mean, to the want of sufficient information?—I referred to the course taken in declining to strike off names from the Register on the authority of one legal opinion as against two or three other opinions of equal authority.

Am I correct in my impression that, whether right or wrong, the course taken by the Medical Council was a course determined by legal advice?—By the advice, I expect, of the solicitor; but I would again call attention to the fact that the report of the committee upon which the Council acted contained no notice whatever of two high legal opinions that had been submitted, but substituted a third, which came at the last moment as a thunder-clap upon us.

I am not at all meaning to question you upon the right or wrong of the course, but only upon whether it was not essentially a legal matter, and whether the Council did not act on legal advice?—They acted on the advice of their solicitor, I believe, rightly or wrongly.

Am I right in my impression that on that occasion no question was raised requiring special Dentistic knowledge in the councillors engaged in the discussion?—I do not think that the question of Dental skill was very much considered any further than that Dr. Quain in advocating the course of the committee, said that he should prefer submitting himself to the barbers who had no anatomical knowledge rather than to many others who were supposed to be very much more highly educated.

I take for granted that you would not insist upon a particular phrase used by a particular counsellor, perhaps not very deliberately. My point is that the Council (as a whole) was dealing with a question which had to be determined by legal advice, am I right in that?—The Council as a whole were told, I think by the solicitor, that they could not discuss this or that question; and it was said by one member of the Council, whose name I need not repeat, that he hoped the resolutions would be so framed as to show that "the Council was simply acting mechanically in obedience to the law." Another member of the Council said, on a later occasion, when speaking of duties of the executive committee, "The Council was called upon mechanically, with a pistol at its head, as it were, to follow the opinion (*i.e.*, Sir Farrer Herschel's) laid before it, and we simply endorsed what was laid down to us as the law by the lawyers." The whole of my point is to show that there is a want of information and a want of well-informed Dental representatives.

You are of opinion that if there had been a member of the Dental Profession attending the Medical Council as assessor he would more strongly have contested the legal view of the case?—He would have more strongly contested the legal view of the case, and he would have been able to adduce evidence which would, I think, have induced the Council to withhold its decision until the question had been more thoroughly investigated legally.

Mr. Cogan.—By the Dentists Act, foreign and colonial Dentists have a right to be registered as well as United Kingdom Dentists in a separate column, have they not?—Yes, assuming that their education is equal to that which is required of English Dentists.

The Medical Council only take degrees of certain foreign colleges? —They take the degrees of certain foreign colleges in accordance with their curricula, and in accordance with such information as their prospectuses furnish in respect of the length and character of their curricula, and in respect of the examinations and also in respect of the examiners.

Can you inform us as to what certificates or degrees of American colleges are allowed to be registered?—Those of the Harvard and Michigan Colleges alone. Our curriculum requires four years' attendance, and their curriculum only requires three years' attendance. The other colleges in America require perhaps only eight months' actual attendance. The examinations are conducted wholly by the teachers, and we hear very little of any rejections, and we know pretty well that persons can go to America and come back with a diploma of Doctor of Dental Surgery from many of their institutions within five or six months, and sometimes within very much less time.

Would that observation apply to the University of Pennsylvania ?—I cannot answer your question off-hand, but all the American qualifications and requirements have been closely analysed, and the results will be found reported in the minutes of the Medical Council. I cannot carry it all in my mind, because there are, I think, something like fifteen of them. The Harvard and Michigan Colleges are the only two institutions that require even the shadow of a preliminary education. We require a preliminary education the same as that required of a medical student.

So that there is full security, at least now, that none but a properly educated person can get on the Dental Register in this kingdom ?—He must have a thorough knowledge of the whole subject of Dental Surgery ; what we have contended for, and what is now being carried out, is, that he should have an education equal to that of a medical man, but differing in some of the details. We strike out of the medical education certain medical specialities, and put our own special subjects in their stead, so that the education can be comprised in the four years, allotted alike to the medical and Dental curriculum. If you were to require that the Dental licentiateship should be taken in addition to the ordinary medical qualification, then you must give six years for the education, which we have contended would be an unreasonable requirement from the bulk of the Dental practitioners.

Was it the fact that a vast number of names were put on the Register shortly after the passing of the Act of 1878, of persons who were by no means qualified ?—A very great number indeed, and with a desire to eliminate some of them we sent in those names to the Medical Council.

At the present moment are there many of those persons still on the Register ?—A great number. In the absence of a public record the Dental practitioners of the United Kingdom were, in May, 1878, on the authority of the carefully maintained private list of Messrs. Ash and Sons, estimated at about 2,000. This well-known leading firm has, for upwards of half a century, supplied the larger portion of Dentists with the instruments and materials used in Dental practice ; hence for the purposes of their trade they have used every available opportunity to possess themselves of the name and address of each Dental practitioner. This list included a limited number of Dentists' assistants and pupils, and of persons who, in conjunction with other callings, practised Dentistry. The initial Dental Register, 1879, contains 5,289 names. Of these 2,049 returned themselves as practising Dentistry with pharmacy; and if reasonable allowance be also made for the Dentists' assistants, pupils, etc., assumed and real, who have registered as having been in practice before the passing of the Act, it will be seen that the estimate of 2,000, as the approximate number of the persons in actual practice, in the sense contemplated when the Act was drawn, and before the word pharmacy was added to Section 6 (c) is justified by the Register. In answer to my inquiry, Messrs. Ash state, "We consider that 2,000 names may be fairly *added* for assistants, etc., pupils of Dentists who have taken advantage of the Dentists Act to register themselves. We regret that many others who had no such professional claim to be registered have got placed upon the Dentists' Register."

CHAIRMAN.—With reference to the question of foreign certificates, it rests with the General Medical Council, I believe, to decide as to the certificates of which of the foreign institutions should be accepted?—Yes, it is entirely in their power.

Have you ever heard of complaints coming from institutions which have applied to have their certificates recognised, and have not been successful?—I have heard that some institutions have made complaints, but members of others have expressed great satisfaction with the course taken, and they have, moreover, said that they hope that sooner or later the course taken here will force their colleges into a higher qualification, and lead to a better state of Dental education, for it is notorious that in America, both in respect to medical and Dental education, qualifications have been obtained with scarcely any knowledge of the subject of either. Confirmation of this statement will be found in "The History of Dental and Oral Science in America, 1876," in "Special Report upon Medical Education and Medical Institution in the United States of America, prepared for the United States Bureau of Education," by N. S. Davis, A.M., M.D., 1776—1876; in the address on "The Relations of the Medical Profession to the State," by D. B. St. John Rosa, M.D., 1879; and in "The Address on Dental Education," by Dr. Eliot, President of Harvard University.

Do you happen to know whether there are any Dentists of eminence who hold foreign qualifications which are not recognised, and which they think ought to be recognised?—I have not any instance in my mind at the present moment. I remember one case where a gentleman contended very strongly that a certain qualification should be recognised, but when the whole thing had been gone into he said, "I believe the General Medical Council have done quite rightly." It was argued by the institution which I represent that you could not reasonably expect a higher qualification of an Englishman than of a foreigner, and that the education which had been gradually perfecting here must be greatly lowered if you registered a great number of the foreign Dental diplomas; and we wish to have the education increased in completeness, and not lowered, to meet on terms of equality a lower standard.

To take the case of France, are the certificates of many of the French Dental colleges accepted?—I do not know of the existence of one.

Is there in France no such thing as an institution which gives certificates?—No, I think not.

Do you happen to know whether there are any such institutions in Germany?—I think there is at least one, but their requirements are at present very slight. One of their representatives was present at the Medical Congress, and he gave rather a lamentable account of their requirements, and hoped that better times would come, and said that he looked upon the Congress as a great means of heightening the degree of education that would be ultimately required of Dentists.

We know that governments abroad are very particular with reference to the qualifications of medical practitioners; but can you tell us whether foreign governments are lax with regard to the qualifications of Dentists?—At present I believe they are, but I think in almost every country now some effective step in this direction has lately, or is about to be taken. For example, in France, Germany, Spain, Switzerland, Canada, New Zealand, etc.

Prof. TURNER.—Then are we to understand that the Dental practitioners in France and Germany are qualified medical practitioners?—They are either qualified medical practitioners, or, I believe, with the exception mentioned in respect of Germany, without any qualification whatever, just as they were here formerly, that is, before the passing of the Dentists Act, when not one *bonâ fide* practitioner in twenty had any qualification.

The General Medical Council has, I think, to frame regulations connected with the registration of Dental students?—Yes.

And the General Medical Council has also, I think, to approve of a Dental curriculum?—Yes.

And to approve of the subjects of the examination of Dentists?—Yes.

So that in your judgment it would be advisable that when those Dental questions are under consideration in the Council there should be some one there who should advise the Council as to the facts?—Yes.

Would you propose that this representative of the Dentists at the Council Board should sit there as a counsellor, that is to say, as equal in position to the other members of the Council, or merely as an adviser or referee?—I should place him on an equality with the counsellors on Dental questions, and give him a vote on Dental questions.

You would give him a vote and a deliberative power?—Yes.

On such questions only?—Yes.

And he should be on all Dental Committees?—Yes; but as I have already stated, I myself should be rather adverse to there being only one representative.

Mr. SIMOL.—Has it occurred to you whether you would extend that same principle to any other of our professional specialities; whether, for instance, you would have representatives of ophthalmology on particular occasions admitted to the Council?—Certainly not, inasmuch as they do not require that additional, very distinctive, and separate education that renders a Dentist efficient, and without which he is utterly useless. Furthermore, while Dental practitioners are counted by thousands, the representatives of any other medical specialty may be counted by tens.

THOMAS EDGELOW, M.R.C.S., L.R.C.P., examined.

CHAIRMAN.—You are a Member of the Royal College of Surgeons and a Licentiate of the Royal College of Physicians?—I am.

And you have been requested by the Association of Surgeons practising Dental Surgery to lay their views before us?—That is so. I appear as the President to express their views.

Will you kindly tell us the objects with which your Association was established?—Our Association has been established entirely with the object of raising the status of the Dental Profession, and amongst the rules that we have, the first is that nobody can be a member of the Association unless he is on the Medical Register; we do not admit any one who is on the Dental Register unless he be on the Medical Register as well, and the only qualification for our Association is that the person shall be on the Medical Register.

Prof. HUXLEY.—And that he has had a complete medical education?—Quite so.

CHAIRMAN.—What steps have you taken to carry out the object of your Association, viz., the improvement of Dental education?—We try to make our views known amongst the Profession as much as possible, and we hold meetings at specified times. We have certain points that we give very great prominence to, which I could, with your Lordship's permission, briefly lay before you.

Do you hold any relations with the General Medical Council?—We have no relations with the General Medical Council.

Do you ever bring cases or facts with relatien to medical education before their notice ?—Our views have been brought from time to time before the General Medical Council by the secretary.

With regard to the General Medical Council, Dentists, as we know, have no direct representation upon that body ; has your Association any strong opinion with regard to that point ?—I cannot bind the Association to the opinion which I am going to give you ; I had not time to get a Council meeting to answer that question as regards the whole Association. For myself, I can only say that I feel that a Dentist, as a Dentist, would be out of place upon the Medical Council. If he is there as a registered member of the medical profession I understand his position, but I do not understand his position there only as a Dentist.

And you individually think that it would be inexpedient to allot a special seat upon the Medical Council to the Dentists' Profession as such, as apart from the institutions which now return members to the Council ?—I do entirely think so.

Are you content with the present constitution of the Medical Council ?—Personally I am.

And you can state to us the views of your Association upon that point ?—My belief is that I am representing in these particulars the views of the Association.

Then virtually you have no especial remark to make with reference to the Medical Council in its relations with the Dentists ?—No, beyond the fact of my believing it to be inexpedient, as I have mentioned, to have a Dentist, as a Dentist, on the Medical Council, and in that I believe I represent the Association, though I cannot speak positively upon the point.

Does your Association approve of the indirect control which is exercised by the General Medical Council over Dentists generally under the Dentists Act of 1878 ?—Our Association would be very glad if the Medical Council had more complete control, and could deal with the names of those who are on the Dentists' lists, as they would do if they were at liberty to exercise their own judgment.

Then your Association approves the objects which the Act of 1878 had in view, namely, the establishment of a relation between the Medical Council as representing the highest controlling body of the medical and the Dental Professions ?—If that implies that our Association at the time approved of the Dentists Act, it did not. We opposed in many particulars the Dentists Act when it was passing through Parliament, but without success.

Would you mind repeating to me the points which seemed to you objectionable in that Bill as it was at that time ?—It seemed to us that under that Bill Dentists are allowed to call themselves surgeons whether they be on the Medical Register or not. That is a point which our

Association have the strongest feeling about. We feel that no one has any right whatever to call himself a surgeon with or without any adjunct word unless he be upon the Medical Register, that is, unless he has a qualification entitling him to be placed upon the Medical Register. We object as much to a man calling himself a surgeon oculist or a surgeon aurist, unless he be on the Medical Register. I have at the present moment in my pocket a current paper with an advertisement in it in which some one who is not on the Medical Register (the name is immaterial), describes himself as "surgeon and practical Dentist." There the public is absolutely misled. The man is not on the Medical Register at all, and I think that in the interests of the public they ought to know whether a man who calls himself a Surgeon-Dentist is a surgeon or not.

Was that the main ground for the dislike entertained by your Association to the Bill of 1878?—It was one main ground. Another main ground was the great number of men whom we considered absolutely unqualified who were allowed to register under that Act; and we feel that as regards that Act it would be a very great thing for the protection of the public if there were a double list made, containing on one side the names of the licentiates in Dentistry, and on the other side those who have no qualifications whatever. At the present time they are all mixed together, and nobody can tell whether or not a man had any qualification before he was put on the Register. Numbers are on the Register who confessedly have no right to be there, and whom an unsucccssful effort has been made to remove.

Prior to the passing of that Act, those unqualified persons could, and I suppose did, practise as Dentists?—They were supposed to do it, but we believe that numbers got on who had no more qualification than a man who opens your door to allow a visitor to come in or out.

Then you hold that, at all events, under the cover of that Act, those persons have obtained a status which prior to the passing of that Act they had not?—Precisely so.

That is the main ground of your objection?—Yes.

Was it legal prior to the passing of the Act for a person to style himself "Surgeon-Dentist?"—That is a point upon which there is a difference of opinion. Before the year 1878, there was a case before the late Lord Chief Justice, who decided that he had no power to stop a man calling himself "surgeon" in conjunction with some other name, although that man was not on the Medical Register.

Will it be possible in future for persons imperfectly qualified to attain admission to the Dentists' Register?—Persons who are not licentiates in Dental Surgery, that is to say, those who have not taken what we consider the minor qualification, cannot be placed on the

Dental Register in future, and undoubtedly that is a valuable safeguard, and I cannot help saying that it is a very good thing indeed that the Act has been passed, though we object to those men who are not qualified being swept in by its provisions. But we aim at something higher, and that is, at having Dentists qualified as medical men as well.

Then your objection to the Act of 1878 is that thereby privileges were created in favour of certain existing persons, and your objection is not to the Act as it will work hereafter?—Certainly, as regards raising the status of the Dental Profession generally, but I do not think that that would touch the question of the use of the word "surgeon." The main thing that we object to is that anybody should be allowed to use the word "surgeon" in conjunction with another word unless he is upon the Medical Register, and is entitled to place his name there by virtue of holding those qualifications.

How would you propose to remedy that defect in the Act?—By a clause in the new Medical Act stating that in future nobody shall be entitled to use the title of "surgeon" or "doctor" in conjunction with any other word whatever unless he be on the Medical Register, or have a qualification which is registrable on the Medical Register.

Would you propose to allow a person who was possessed of the qualification of the College of Physicians in Edinburgh, and also had qualified as a Dentist, to style himself "Surgeon-Dentist?"—Might I answer that by putting a question? Would such a person be allowed to practise any other branch of surgery under similar existing circumstances? If that is the case, I say yes; if not, I say no.

Then may I take it that your objection to a person styling himself "Surgeon-Dentist" is not that he is not a member of the College of Surgeons, but that he is a person not on the Medical Register?—It is so.

Are there any other defects in matters of what I may call a penal nature to which you wish to call our attention, and to which the Act of 1878 does not in your opinion sufficiently attend?—I know of none.

Are you of opinion that it would be expedient to place the Dentists under a separate and special Act, and to govern them by a separate Medical Council of their own?—Dentists, as Dentists, if they are to be separated from the medical profession, I think had far better have their own absolute guidance, and be left entirely apart from the medical profession. If they seek for a separate status as Dentists they should be ruled by Dentists.

Should you yourself be in favour of separating Dentists from the remainder of the medical profession?—Since the Act passed I should be in favour of separating Dentists *qua* Dentists from the remainder of the medical profession; but I should strongly object to surgeons who wished to practise Dentistry being cut off from the body of the profession.

Would you give the number of members of your Association ?—Fifty-five, and ten honorary.

Mr. Simon.—You take great exception to the use of the term "Surgeon-Dentist" for persons who are not members of the College of Surgeons ; in the judgment of Lord Chief Justice Cockburn, to which you referred, was not the view taken by him that "Surgeon-Dentist" was a compound word in the same way as the expression "veterinary surgeon" is a compound word, and that a man calling himself a Surgeon-Dentist was not calling himself a surgeon ?—That view was taken, and that is why I wish that the new Act should expressly state that that view could not be taken in future.

And was it not alleged that from time immemorial the expression "Surgeon-Dentist" had been used as a compound word, and had not been understood to encroach at all upon the province of surgeons ?—I am not sufficiently up in the judgment of the Lord Chief Justice to give an answer to that question.

As regards the other point to which you referred, viz., the indulgence which, when the Act passed, was shown to persons already in practice, and which brought upon the Register a certain number of persons whom you considered very indifferently qualified, if you had had the making of that Act, what other principle would you have adopted, if any, than the principle which was adopted, of admitting to the first Register all persons who were already *bonâ fide* in the practice of Dentistry ?—I felt the difficulty so much that I am bound to say that I opposed the Act as strongly as I could when it was passing.

And yet you think that the Act has been of advantage, and is of advantage to the profession of Dentistry ?—I think it will be hereafter. At the present moment I can hardly say, having regard to the mixed people that are registered, that the Profession is at present particularly raised by it. I believe that it will undoubtedly be ultimately raised by it as soon as those men of whom I speak have in course of time died out.

You are of course familiar with the fact that in all analogous legislation (for instance, on the passing of the Apothecaries Act in 1815) whenever a first register has had to be made, persons already *bonâ fide* in the position for which provision has had to be made, have been recognised as being entitled to registration ?—I quite admit the whole difficulty.

So that, in fact, unless that had been done, a first register could not have come into existence ?—No, but I think it might have been made a little more exclusive.

Professor Huxley.—Did I correctly understand you to say that you would desire legislation of such a nature as to forbid any one to practise Dentistry who is not on the Medical Register ?—No, I did not mean to say that at all.

You did not wish that ?—No, not at all, only to prevent persons calling themselves surgeons who are not surgeons. I do not want to touch their right to practise as, or to call themselves Dentists, but I think that no one ought to call himself surgeon-oculist, or Surgeon-Dentist, or surgeon anything, unless he be entitled to be on the Medical Register.

CHAIRMAN.—We had here just now the representative of the British Dental Association, has your Association the same objects as the British Dental Association ?—I think that the British Dental Association would differ very strongly from my view about the word "surgeon." I think they would like all those who are on the Dental Register to be allowed to call themselves Surgeon-Dentists. That is the main point of difference. We have to recognise legislation which has taken place. The Dentists Act has passed, and we recognise it, but we wish in future, if possible, to have some means by which the public can know whether or no a man is a surgeon who calls himself a Surgeon-Dentist, and whether, when he calls himself a "Surgeon and practical Dentist," it means that he is a surgeon. In this case that I am referring to, of the man whose advertisement I have in my pocket, he is no surgeon at all, and he advertises and calls himself a "Surgeon and practical Dentist." The public gather from that that he is a surgeon, but he is not a surgeon—he is not on the Medical Register at all.

RICHARD QUAIN, M.D., F.R.S.

CHAIRMAN.—Is there anything further that you wish to mention to the Commission ?—I would venture to suggest that it would be very desirable to amend the Dental Act. A great mistake has been made in appointing the general body of the Medical Council to carry out the details of this Act. In the Duke of Richmond's Bill there was a clause which gave the Council power to appoint a board that would have carried out all those details wtthout imposing the duty on the Council. This board could have carried out those details in an inexpensive form. The Council, according to the Duke of Richmond's Bill, could have made rules which, when approved by the Privy Council, would have had the force of law. Instead of which the Dentists have chosen to adopt the Medical Act of 1858 as a model, an Act the amendment of which is the very subject under your consideration. It would be very desirable that the Act should be amended in accordance with the principle contained in the clause of the Duke of Richmond's late Bill (Clause 22, Medical Act, 1858, Amendment Bill, H.L.), and that in any amended Act there should be power taken to divide the Dentists into two classes, those who have a qualification by examination, and those who are only qualified on their own declaration. The Council is threatened with law proceedings on the subject. If it could be possible under the Amended Act to follow the example set in the Act obtained by the Veterinary Surgeons in the last session, in which all registered persons are divided into two classes, one, those who have obtained qualifications by examination, and the other by their own declaration, there would be an end of the present contention. The contention is that the Medical Council should take off the names of 400 people who have been put on the Register on their own declaration of being engaged in the practice of Dentistry prior to the passing of the Act. Their claim depends upon the interpretation of a very ill-worded section of the Act, and if this could be settled under an Amended Act by the persons registered being put into two divisions, it would be an advantage.

Any person who chooses to call himself a practising Dentist is entitled, is he not, to have his name put on the list?—Yes, coupled with the declaration that he is engaged in Dentistry or Dental Surgery. One of the questions which has arisen is whether a man who extracts 500 or 600 teeth a year, and who has been a dresser in a German hospital, can declare that he is a person *boná fide* engaged in the practice of Dentistry.

The COMMISSIONERS in their Report said, relative to Dental matters, "The Association of Surgeons practising Dental Surgery appeared before us by their President, asking that qualified Dentists not on the Medical Register should be prevented from styling themselves 'Surgeon-Dentists.' We do not see our way to make such recommendations."

"The British Dental Association have asked for direct representation upon the Medical Council. We cannot recommend that this should be granted."

EDINBURGH DENTAL HOSPITAL AND SCHOOL.

A MEETING of the Directors of this Institution was held on Aug. 11th in the Dental Hospital, Chambers Street—the Rev. Dr. Sandford presiding.

Mr. Bowman Macleod, the Dean of the Institution, submitted the half-yearly report, from which it appeared that there had been 2,352 patients treated at the hospital during the past six months. The number of fillings was 253, of which 70 were gold, 143 alloy, and 37 plastic. In regard to their students who were attending the University medical classes, the Dean said he had a gratifying report to make. During the winter session Mr. James Graham Munro obtained first prize in physiology, while Mr. David Dewar Hepburn was second prizeman in anatomy. For the summer session, in the junior division of the practical anatomy class, although medical students were in the proportion of five to one of the Dental students, three out of the four honours in the class were gained by Dental students—James Johnston taking first place, James Graham Munro second, and John T. S. Hughes, fourth place. In the Chemistry classes at Minto House, Messrs. Hughes and Munro received each 92 per cent. of marks, and Mr. Johnston 89 per cent. In the special work of the Dental Hospital Practice, the prize for senior students has been gained by Mr. Joseph S. Thomson, and that for junior students by Mr. James Graham Munro.

A prize fund having, through the generosity of the Licentiates in Dental Surgery of the Royal College of Surgeons of Edinburgh, and a few friends, been placed at the disposal of the senior members of the hospital staff, they have much pleasure in placing the following prizes in competition for the Session 1882-3 :—

A Prize for General Excellence in Hospital Practice, and Senior and Junior Prizes in the Classes of Dental Anatomy, Dental Mechanics, and Dental Surgery.

Dr. Joseph Bell was elected honorary consulting surgeon to the dispensary, in room of the late Professor Spence.

The Chairman presented the prizes offered by the Dean for general excellence in Dental Hospital work during the summer session to Mr. Thomson and Mr. Munro. In congratulating the students on the nature of the report, Dr. Sandford said it was gratifying to know that the recent Act of Parliament had done much to raise the status of the gentlemen who belonged to the Dental Profession to a higher level than hitherto, and he was sure that the sense which their instructors had of the benefit of the Act of Incorporation would tend greatly to raise in the students' own estimation the work to which they were going to devote themselves.

A vote of thanks to the chairman concluded the proceedings.

OBITUARY NOTICE.

J. T. CLOVER, F.R.C.S.

THE announcement of the death of Mr. J. T. Clover, F.R.C.S., Lecturer on Anæsthetics at University College, is received with much regret. Mr. Clover has long been in ill health, and for several months past his practice has been carried on by deputy. The Medical and particularly the Dental Professions owe much to Mr. Clover's inventions and literary contributions relating to Anæsthetics.

THE DENTAL MANUFACTURING COMPANY.

THE Dental Manufacturing Company has lately paid its shareholders an *interim* dividend of five per cent. By an alteration of the rules, its financial year is now made to end in December instead of in June as hitherto. Judging from the very considerable increase in the returns of this over any previous year, it is expected that the profit for division in February will be the largest the Company has yet had.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

To the Editor of the DENTAL RECORD.

MR. EDITOR,—In the *Cosmos* for August last, Dr. Bonwill, of Philadelphia, U.S., gives an elaborate description of his Amalgam* and how to mix it, and at page 424 he states, "*The treatment of Gold with Mercury is, I believe, new.*" I beg to inform him, through the medium of your Journal, it is not new, as the following formula published in the *Pharmaceutical Journal*, March 1, 1850, vol. ix., p. 404, will show:—

"AN AMALGAM FOR STOPPING TEETH.—Chloride of Silver is prepared by precipitation from Nitrate by adding common salt. A pasty deposit immediately takes place, and when all the silver is thrown down (which is known by the addition of a few drops of Hydrochloric Acid not rendering the fluid turbid), it should be washed and drained, so as to leave a pasty mass. Into this a piece of zinc is immersed. In the course of two or three days (according to the quantity submitted) all the silver will be reduced to the metallic state; you then remove the zinc. To ascertain the weight of silver you have to amalgamate, it is necessary to weigh the piece of zinc before submitting it to the paste, and the loss of weight which the zinc sustains will be equivalent to the weight of metallic silver produced. To this may be added six or eight times its weight of Mercury, which must be triturated in a mortar, with warm water, for several hours, or so long as the mass continues in the least to discolour the water. The operator will discover the pasty adhesiveness which the amalgam will acquire as he proceeds; and for this part of the process it is better to have an excess of mercury which can be squeezed out, and should leave, at the conclusion of the operation, an amalgam composed of one part of silver and four parts of mercury. This amalgam of silver is to be united with an amalgam of gold. The amalgam of gold may be prepared by putting ribbons of pure gold (similar in thickness to that which gold beaters commence beating with) into heated, or nearly boiling, pure mercury, and in the proportion of four of mercury to one of gold. This may be poured into a mortar containing water, and washed, as the silver amalgam, so long as the least discolouration appears in the water. This should be freed of its superfluous mercury, and the mass should consist of gold one part, mercury three parts. The amalgams being now perfectly pure, it may be well to keep in separate boxes the little pellets necessary for combination of the compounds, and the proportions are two parts by weight of the gold amalgam to one of the silver. It is found to become a more compact mass by the first crystallization, although, should there be any residue, it may be heated, rubbed up again with a fresh supply for a future operation. The two pellets had better be triturated thoroughly in a mortar before the compound is submitted to the flame of a spirit lamp; and for the better incorporation, it is necessary to submit it to heating and trituration in the usual way, three or four times."

Therefore, the addition of Gold to Mercury for Amalgams was known to the Dental Profession thirty-two years ago.

I am, Mr. Editor,
Yours faithfully,
E. GREGORY, M.D., D.D.S., L.D.S.I.

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* The substance of this communication is reproduced at page 413 of the *Dental Record.*—ED.

Editorial.

THE TREATMENT OF EXPOSED PULP.

The majority of Dental Practitioners treat, in some form or other, the pulps of teeth. Many do so with a certain amount of care, and conformably with their notions of what constitutes antiseptic and disinfective treatment. But according to the recognised principles of Antiseptic Surgery, as applied to the preservation of an exposed tooth pulp, greater precautions are required than are generally observed. For this purpose strong rather than dilute carbolic acid is very frequently used, to the exclusion of other valuable antiseptic agents.

The three articles which we publish in this number of the Record—"A Plea Against Pulp Extermination;" "Therapeutics of the Dental Pulp;" "The Diffusion of Bacteria"—bear directly upon the subject under consideration; and as the question is one which concerns those who desire to rightly practise Dental Surgery in its higher phases, those articles are especially interesting.

It will be observed that in the first and second articles the use of the rubber dam is advocated in preparing and dressing the tooth, a requirement which has been noticed by other writers. Indeed, without its use, it is almost impossible to insure a completely aseptic condition of the atmosphere surrounding a carious cavity and exposed pulp. It is within the experience of many practitioners that there have occurred periods when failure followed their efforts to preserve exposed pulps. The cause of such series of coincident failures is probably the state of the atmosphere at the time of treatment—a condition favourable to septicity. The diffusion of bacteria and allied species, which seem to be associated with, if not the cause, of suppuration, is a subject of much importance; and it is satisfactory to know that in the Dental Profession there are workers in this line of investigation. The address delivered by Mr. C. S. Tomes, at the Liverpool Meeting of the British Dental Association, (an abstract of which was published on page 426) was not only a very lucid exposition of our present knowledge of the relation of these micro-organisms to suppuration, but it also indicated the lines of further research.

Just as are recognised the exact causes and circumstances of simple exposure of a healthy pulp, or of suppuration of a pulp, whether exposed or not, so will the true knowledge of treatment be possessed; and according to the accurate or scientific application of that knowledge in the treatment of those conditions will success therein largely depend.

GOSSIP.

MIXED human saliva has been examined by by F. Hammerbacher. In 1,000 parts of mixed saliva from a healthy young man he found:—

Water	994·203
Solids	5·797
Epithelium and mucin	2·202
Ptyalin and albumin	1·399
Inorganic salts	2·205
Potassium sulpho cyánate	0·041

In 100 parts of the solids were 37·985 parts of epithelium and mucin, 23·978 ptyalin and albumin, 38·037 inorganic salts. The ash contained:—

K.	Na.	CaO.	MgO.	P_2O_5.	SO_3.	Cl.
45.71	9·59	5·01	0·16	18·85	6·38	18·35

1·803 per cent. of the sulphuric acid existed as such; the rest is derived from the organic matter.

WRITING in the *Electrician*, Col. J. D. Shakespeare, with regard to what electricity is, says:—Let me now observe that the world rolls round itself at the rate of 1,000 miles an hour, and travels round the sun at the rate of 6,500 miles an hour, the atmosphere travelling with it. Is it not a fact that our planetary system works from east to west by the south, and that our world revolves from west to east? Surely with such motion there must be a "slip" producing friction and electricity. If there is a "slip," then electricity would be an effect of Nature's laws of friction; but whether that friction produces it *de novo*, or stimulates it into action from a latent state, I am not prepared to say, but prefer the latter theory. If it is a "primary," there is no use in asking "What is electricity?" but we may ask—"Where is its source?"

THE Essay for the Collegial Triennial Prize of the Royal College of Surgeons of England, consisting of the John Hunter Medal, executed in gold to the value of fifty guineas, or, at the option of the successful author of the dissertation, of the said medal executed in bronze, with an honorarium of fifty pounds, will be received up till December 30th, 1882. The subject of this prize is—"The Relation between the Radicles of the Lymphatic System and Capillary Vessels." The subject for the Jacksonian prize for the present year, 1882, is—"Wounds and other Injuries of Nerves, their Symptoms, Pathology, and Treatment;" the subject for the prize for the ensuing year, 1883, is—"The Pathology, Diagnosis, and Treatment of Obstruction of the Intestines in its various forms in the Abdominal Cavity."

HERREN NIES AND WINKELMAN are reported to have made a series of experiments on the changes in volume of metals on cooling from fusion. They find that tin, zinc, bismuth, antimony, iron, and copper, all expand at the moment of solidification, and they have reason to believe that the same holds good for lead and cadmium. They believe, in fact, that all metals expand on solidification, which, it should be noted, means the moment of solidification, as the majority contract on cooling It is only at the moment of change from the fluid to the solid or semi-solid state, that the expansion takes place.

M. REGNARD heated the blood of animals to 100°c., and the coagulum thus obtained was pressed and rapidly dried in a stove, and then powdered in a coffee-mill. It was found to keep well. Three lambs were kept on the ordinary diet of beetroot, hay, etc., and three others were fed upon the powdered blood The former steadily lost flesh, while the latter increased to three times their original weight. While a blood diet is thus found to be beneficial to herbivora, results are said to have been most encouraging in the case of a rickety child eighteen months old.

MR. FLEITMANN, in the year 1879, succeeded in rendering nickel malleable by adding to it, whilst in a state of fusion, $\frac{1}{8}$ per cent. of magnesium, introduced through a hole in the top of the crucible, a few lumps of charcoal having been previously added. In this way it is possible to produce malleable nickel which can be welded to iron or steel at a white heat, and rolled into thin sheets without separation. Fleitmann failed to get the same results by the use of manganese, aluminium, or calcium.

LIVING protoplasm, say Dr. Oscar Loew and Dr. Bokorny, owes its property of life to the presence of aldehyde groups, which are characterised by intensely active atomic movement. When death takes place, it is coeval with and caused by a transformation of these aldehyde groups into amyd groups, with diminished molecular motion, thus leading to cessation of action.

THE operation of gastrostomy was successfully performed by Sir William MacCormac, on July 21st. The patient, a man who had malignant stricture of the œsophagus, is now fed through the opening in his stomach four times a day, having a pint of milk with a couple of eggs, or a pint of soup at a time, and is gaining flesh.

An extensive deposit of bismuth in the form of metal and oxide has been discovered in the north-east of New South Wales. Hitherto the bismuth of commerce has chiefly been derived as a bye product in the treatment of zinc, cobalt, and silver ores, and has commanded a price quite out of proportion to the cost of production.

Mr. S. J. Hutchinson, Curator to the Odontological Society, is preparing a paper, which he hopes shortly to read before the Society, giving the results of a critical examination of the large collection of skulls, recently added to the Museum of the Royal College of Surgeons.

Mr. A. H. Keane submits that the hypothesis of a common primeval linguistic germ is both rational and adequate, whereas the hypothesis of speechless races is both improbable in itself, and fails to account for the very conditions to explain which it has been invented.

At the Annual Meeting of the Royal College of Surgeons, held on July 13th, Mr. Spencer Wells was unanimously elected President of the College to fill the vacancy occasioned by the retirement of Sir Erasmus Wilson, LL.D., F.R.S., whose period of office had expired.

M. Demarçay recently communicated to the *Académie des Sciences* the results on the vapourization of metals *in vacuo*. This was effected at very low temperatures. The volatility of cadmium was 160°c.; that of zinc, 184°c.; antimony and bismuth, 292°c.; and tin, 360°c.

The combination of gas without flame was demonstrated by Mr. Thomas Fletcher, at the *Soirée* of the Chemical Society, held at Owen's College. He obtained from ¼-in. gas-pipe sufficient heat to fuse wrought-iron into drops.

The annual circular of the *Medical Directory* has been issued, and Licentiates in Dental Surgery who have not received a copy, and desire their names to be included in the Directory, should write to Messrs. Churchill, 11, New Burlington Street, W.

In a paper contributed to the Mineralogical Society, by Messrs. J. I'Anson and E. A. Pankhurst, it is shown that they have been practically successful in the artificial production of agate, chalcedony, onyx, etc.

Mr. H. Charles Smale, L.D.S.Eng., Manchester, has been appointed Honorary Dental Surgeon to the Ardwick and Ancoats Dispensary and Ancoats Hospital, Manchester.

Phenylamine produces an intense colour in bacteria, so that they appear large, and can be recognised with a low power, even, it is said, of 250 diameters.

The amount of hæmoglobin in the blood of animals kept in the dark decreases, whereas, it is said, the opposite occurs if they be fully exposed to light.

Mr. Willoughby Weiss, L.D.S.Eng., has been appointed Hon. Dental Surgeon to the Western General Dispensary, Marylebone Road, W.

Francis J. Van Der Pant, L.D.S.I., has been elected Hon. Dental Surgeon to the Surbiton Cottage Hospital.

INTERCOMMUNICATIONS.

Answers.

(10). Verax.—(Babbitt's Metal.)—In reply to "Verax," the alloy given in page 59 of my "Metallurgy," is not identical with Babbitt's Metal, but is a modified form of this alloy, the formula for which was given to me by H. Lory Jacob, Esq., of Birkenhead. It is very similar, practically identical with that form of Babbitt's Metal called "Hardening," which contains 4 copper, 8 antimony, 24 tin. This should always be melted at first in making, under a layer of powdered charcoal or sawdust. Babbitt's Lining Metal is composed of one part "Hardening" to two parts tin, and is, I think, too soft for regular use in making dies. I am not aware that the particulars as to specific gravity, etc., have ever been published, and an alloy can hardly be expected to possess an "atomic weight." The multiplication of casting metals and alloys in the laboratory is an evil, causing constant liability to mistakes; and having found that zinc and tin, either together or separately for dies, and tin or lead for reverses, were amply sufficient to do first-rate work, I never attempted to use other alloys in practice, although for purely experimental purposes I have frequently used cast-iron, brass, etc. Cast-iron has many special advantages, and if I were to begin again, I should be disposed to use this metal exclusively for dies; its shrinkage is extremely small, and its hardness is ample to enable a difficult plate to be finished to one die. It can be melted in the injector furnace as quickly as zinc in a ladle furnace.—Thos. Fletcher.

(10.) Verax.—(Babbitt's Attrition Metal.)—Named after its inventor, Isaac Babbitt, of Boston, is an alloy consisting of 9 parts of tin and 1 of copper, used for journal-boxes (*vide* patent, 1839). Some variations have since been made, as the following :—

			Scientific American recently gave following
Copper	1	1	4
Regulus of Antimony	1	5	8
Tin	10	50	96

Some substitute zinc for antimony. The term is commonly applied to any white alloy for bearings, as distinguished from the "box-metal" or "brasses" in which copper predominates. Perhaps the most common form and method is as follows:—

Copper	4 lbs.
Banca Tin, best	24 lbs.
Regulus Antimony	8 lbs.

Melt separately, pour the antimony into half the quantity of the tin, then mix with the copper away from the fire in a separate pot, and add remainder of tin. In melting the composition it is better to keep a small quantity of powdered charcoal on the surface of the metal. The above composition is called "Hardening." For lining the boxes, take 1 lb. of the "Hardening" and melt it with 2 lbs. of Banca tin, which produces the lining metal for use. Thus the proportions of this lining metal are—

Copper	4 lbs.
Regulus Antimony	8 lbs.
Banca Tin	96 lbs.

This metal is nearly as hard as zinc, and has less shrinkage; it may be obtained at almost any metal dealers or machine shop.—C. J. B. WALLIS.

FRANK HALL.—We regret the omission. But your qualification is not in the current Dentists' Register.

Communications.

Communications have been received from Walter Whitehouse, London; The Secretary, Royal College of Surgeons, Edinburgh; H. Chas. Smale, Manchester; John Laws, Weymouth; F. St. B. Taylor, Dublin; Alex. Duncan, Glasgow; Munro Scott, London; John S. Amoore, Edinburgh; The House Surgeon of the National and the London Dental Hospitals; Instrument; Verax.

For September.—Thomas Fletcher, Warrington; C. J. B. Wallis, London; E. Gregory, Cheltenham; Claudius Ash & Sons, London; F. H. Briggs, Manchester; Willoughby Weiss, London; Frank Hall, Hertford; Frederic Rose, Liverpool.

Books, &c., Received.

"Journal of British Dental Association;" "British Journal of Dental Science;" "Dental Register;" "Sanitary Record;" "Chemist and Druggist;" "Dental Regulations" of the Royal College of Surgeons in Ireland, of the Royal College of Edinburgh, and of the Faculty of Physicians and Surgeons of Glasgow; "L'Odontologia;" "L'Odontologie;" "Dental Cosmos;" "American Journal of Dental Science;" "Items of Interest;" "New England Journal of Dentistry;" "Ohio State Journal of Dental Science;" "Southern Dental Journal;" "Progrès Dentaire;" "Cheltenham Chronicle;" "Rhyll Journal;" "Penny Paper;" "Alloa Journal;" "Annual Report of Liverpool Dental Hospital;" "Report of Medical Acts Commission;" "Calendar" of Guy's, Middlesex, St. George's, Westminster, Charing Cross, St. Thomas's, London, and St. Mary's Hospital Medical Schools, London; also of the Queen's College (Birmingham), Edinburgh Dental Hospital, London Dental Hospital, Exeter Dental Hospital, Plymouth Dental Dispensary, and University of Michigan, &c.

For September.—"Journal of British Dental Association;" "British Journal of Dental Science;" "Dental Cosmos;" "Dental Register;" "New England Journal of Dentistry;" "Southern Dental Journal;" "Missouri Dental Journal" (August); "Progrès Dentaire;" "Le Progrès Dentaire" vol. II.; "L'Odontologie;" "Zahntechnische Reform" (Aug. and Sept.); "El Progresso Dental;" Prospectus of the University of Durham; Calendar of London School of Dental Surgery, 1882-83; "Sanitary Record;" &c.

THE

DENTAL RECORD.

VOL. II. NOVEMBER 1, 1882. No. 11.

THE ELECTRIC MALLET—ITS CONSTRUCTION AND ACTION.

A Paper read before the British Dental Association, August, 1882.

By E. J. LADMORE, L.D.S.Edin.

MR. PRESIDENT AND GENTLEMEN,—

Before commencing the description of the Electric Mallet I wish to state that the subject was suggested to me by Mr. J. S. Turner, that gentleman having heard that the Mallet now on the table was of my own construction. Such being the case, it is only right for me to point out that my Mallet has no claim for originality, as it is almost identical in structure with the one supplied by the S. S. White Dental Company. With this brief explanation I shall endeavour to describe the construction and action of this beautiful little instrument. For the invention of this method of applying our new drudge, electricity, to the requirements of the Dental Surgeon we are indebted to Dr. Bonwill, a well-known American Dentist, who is also an exceedingly clever and ingenious mechanician, as exemplified by his Dental Engine and Engine Mallet, the latter of which threatens to become a serious rival to his earlier invention.

Dr. Webb states in the *Cosmos* for November, 1880, that the idea of the Electric Mallet was suggested to Dr. Bonwill by hearing the rapid tapping of the "sounder" of a telegraphic instrument in a large hotel at Philadelphia, and it occurred to him that if the force of the tapping could be increased, so that the armature would act as a mallet upon the end of a plugging instrument, it would prove the one thing needed for the rapid and perfect condensation of cohesive gold in filling teeth.

So impressed was Dr. Bonwill with this idea that he set to work, and, assisted somewhat by studying the construction of the Morse instrument, he produced, after considerable modifications, the Electric Mallet, with which his name should always be associated.

The Mallet did not, however, remain long in the form given to it by Dr. Bonwill, but, as occurs with most inventions, fresh thought was brought to bear upon it, and the Mallet was further elaborated by Dr. Webb, who might fairly be called a specialist in the use of this instrument. He took up the idea, commencing where Dr. Bonwill had left off, and by introducing fresh details, modifying others, and reducing its bulk, he gave us the Mallet in its present form, which is so complete and perfect in all its parts as to render it apparently impossible to introduce any further improvements.

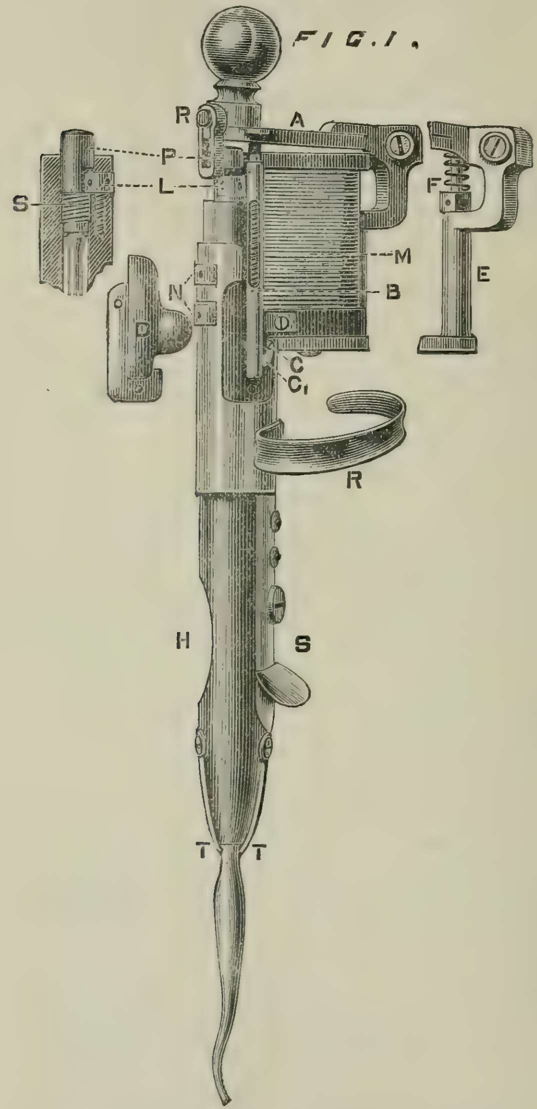


FIG. 1.

To be better understood, I have prepared rough diagrams of the Mallet and its details. Also on the table are two of the actual instruments, one of them complete, the other in pieces to show its construction.

Having given its history, I will now address myself to the somewhat difficult task of explaining the different parts, and will endeavour to express myself as distinctly as possible, hoping, ere I conclude, to succeed in convincing those not familiar with it of the extreme simplicity of this apparently complicated piece of mechanism.

FIG. 2.

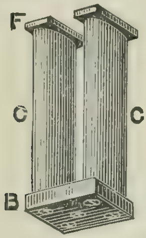


FIG. 3.

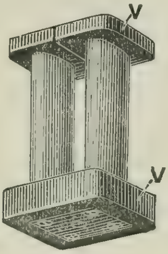


FIG. 4.

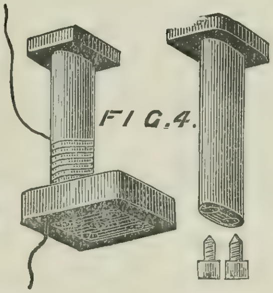


FIG. 5.

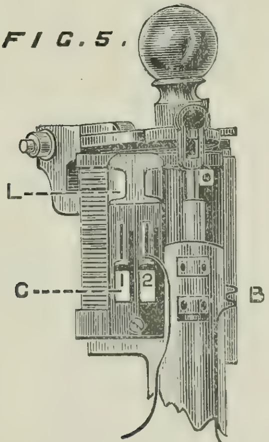
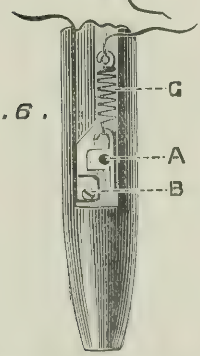


FIG. 6.



The principal part of the Mallet is its electro-magnet, shown in fig. 1 at M; also more distinctly in figs. 2, 3, and 4.

It is made of soft iron (Swedish preferred, on account of its extreme purity), and is composed of three separate pieces screwed together, viz., the two cores marked, C, fig. 2, and the base-plate B.

The cores are $1\frac{1}{4}$in. long, $\frac{5}{8}$in. broad, by $\frac{3}{16}$in. thick, and are filed oval in section, in order that they may be more closely invested by the insulated copper wire, care being taken to retain the corners of the upper ends at F (fig. 2), which serve to retain the vulcanite flanges, to which I shall shortly allude.

The cores stand upon a flat plate of iron, marked B, fig. 2, which is $\frac{5}{8}$in square by $\frac{1}{8}$in. thick, and are fastened to it, with their flat sides parallel to each other, $\frac{1}{4}$in. apart, by four screws, two into each core, which pass through the base-plate and have their heads counter sunk.

The vulcanite flanges V, fig. 3, on the upper end are $\frac{1}{10}$in. thick. They are made in two pieces, one for each core, on which they are fitted after the screws and plate are removed, sliding just lightly on, and are prevented from coming off by the corners F, already mentioned, which are recessed into the rubber.

The vulcanite flange for the bottom end of the magnet is fitted on in the same manner, and is $\frac{2}{10}$in. thick, or just twice the thickness of the upper one, in consequence of having the base-plate of the magnet recessed into it.

The magnet is now taken to pieces and well annealed in a charcoal fire to remove any hardness which may be imparted to it by filing, drilling, etc., after which the flanges are replaced and each core covered with a single layer of silk, fastened with shellac varnish, or paper saturated with paraffin wax, to thoroughly insulate them from all possible contact with the copper wire, the winding of which is the next stage.

To facilitate this operation one core is removed, as in fig. 4, and a hole drilled through the bottom vulcanite flange to hold the starting end of the wire, which is No. 28, silk covered, and is laid well and evenly with the coils close together in five distinct layers, the wire being in one continuous length, but each layer insulated from the preceding one by a single thickness of tissue paper saturated with shellac varnish or paraffin wax.

When one core is covered it is removed and the same process repeated with the other, simply observing that they are both wound in the same direction. This done, the screws are replaced and the *outer ends* of each coil twisted together and joined with soft solder. Of the two remaining ends one is finished off at a platinum point under the thick rubber flange at C, fig. 1, and the other is connected directly to the post I, on the connecting block C, fig. 5. This completes the magnet.

What I may call the framing needs little description. It is made of German silver or brass, see fig. 1, and consists of a tube which holds the vulcanite stem and the ring R, through which the forefinger is passed in using the instrument. A flat piece of metal is soldered at right angles to the tube, forming a platform upon which the magnet stands. To this platform is also attached the pillar E, which for distinction is shown detached on the right of fig. 1. It carries the hinge of the armature A; also the spring and regulating nut F, which cause the armature to fly up each time the electric current is broken.

The armature A is a flat plate of soft iron, $\frac{1}{8}$in. thick, hinged at one end, with a brass knob at the other to give additional weight to the blow.

At the top of fig. 1 is R, the regulator which regulates the force of the blow by limiting the movement of the armature, which movement is increased or lessened by the nuts N. In the Mallet supplied by S. S. White there is only one nut, but two are, perhaps, preferable, because when the proper regulation is arrived at they may be jammed one against the other to prevent the regulator from working loose by the vibration.

The stem is of round vulcanite, 5in. long by $\frac{1}{2}$in. in diameter, having a $\frac{3}{16}$in. hole drilled through it from end to end into which the plugging instrument is passed until it reaches the plunger P.

The plunger is immediately under the knob of the armature, and receives the blow which it communicates to the plugger. It is placed in the top of the stem, which arrangement is shown more clearly in section a little to the left, and will be seen to consist of a cylindrical piece of vulcanite, P, held in the central hole of the stem by having the square head of a screw, L, recessed into its side, which allows limited movement up or down. It is encircled by a spiral spring, S, which brings the plunger up after it has been struck by the armature.

The screw L also serves the purpose of regulating the height of the plunger.

The depression H on the side of the stem is to receive the thumb in holding the Mallet, and is filed so deeply as to expose the central hole, thereby enabling the thumb to rotate the plugger when required.

At the bottom of the stem are two steel springs, T, which grip the plugging instrument at its constricted part, bringing it up again after the blow has been struck by the armature.

The contact break or interrupter B, fig. 1, shown with its protecting shield D removed, is a device for interrupting the electric current, enabling the Mallet to give a rapid succession of blows automatically.

It consists of a tube, B, fixed upon the side of the magnet, with a wire sliding inside it. This wire has a part, C^1, projecting beyond the side of the tube, and moving in a slit in the lower end of it, which allows the wire to slide up or down, but prevents it from turning round. The part of the wire C^1 is held in contact with C (which is the platina termination of the copper wire coiled upon the magnet) by a spiral spring which encircles the wire and rests upon a shoulder inside the tube B, exerting a pressure upwards against the end of an inner tube which is screwed upon the top end of the wire, and has at its extremity a piece of vulcanite continuous with it which is struck by the armature

There now only remains for description the connection C, shown in fig. 5, which consists of two posts, marked 1 and 2, and a metal strap, L, all three of which are riveted to a strip of vulcanite, and fastened upon the side of the magnet opposite to the interrupter.

The battery wires are passed through the strap, and their ends, which terminate in small tubes, are pushed on the posts 1 and 2.

As already explained, the post 1 is connected with one termination of the coil of wire upon the magnet. The post 2 has a copper wire carried from it down the stem, terminating at B, fig. 6, which represents a portion of the stem with the slide S removed. Another copper wire, fastened to the tube of the contact breaker at B, fig. 5, is carried down the stem, terminating at A, fig. 6, which is moveable and connected with the spiral spring C, being acted upon by the slide S.

The Mallet is held in the right hand like a pen, with the forefinger through the ring R, and resting upon the slide S, the thumb resting on the stem at H.

It will now be seen that when the battery wires are connected and the slide S is pushed down by the pressure of the forefinger, carrying A, fig. 6, into contact with B, the current passes from the post, 1 fig. 5, through the coil of copper wire upon the magnet to its platina termination C, and from thence through the interrupter, down the stem to A and B, fig. 6, and finally up the stem to the post 2, fig. 5, thus completing the circuit with the battery, which excites the magnet, causing it to attract the armature, which in turn strikes the plunger P. At this point the interrupter comes into play, and is pushed down, breaking the contact between C and C^1, which momentarily deprives the magnet of its power of attraction, and allows the armature to fly up to its original position by means of the spiral spring F. This releases the break which rises, bringing C and C^1 again into contact, and the current again excites the magnet, and so on; and it is by this alternate make and break that the Mallet gives from 400 to 800 blows per minute.

When the finger is removed from the slide S all action ceases.

I fear that my description has been very imperfect, and that I have failed to make some points as clear as I could have wished, and can only say that it will give me very great pleasure, so far as lies in my power, to endeavour to answer any questions upon the subject. So much time has already been occupied that I will not weary you with a description of the battery, which is the great difficulty, but will just observe that, so far as my limited experience goes, the Fuller form is perhaps the best.

The Electric Mallet cannot be recommended to those who only occasionally undertake the filling of teeth with cohesive gold, because it would not compensate them for the trouble and expense of keeping the battery in order; but for operators who are frequently doing this class of work nothing could be better. Dr. Webb says, "The comfort I have derived from its use has added years to my life."

In summing up the advantages of the Mallet I would observe that the blow is so rapid and uniform in weight that the whole mass of the filling is uniform in texture, and, besides, while the quality of the work is improved, the operator is enabled to condense the gold so much more rapidly than by other methods as to save both himself and patient an immense amount of fatigue.

In conclusion, I am convinced that in these days of rapid progress in scientific attainments it is the duty of every one to adopt any appliances which may tend to the perfection and durability of our work, so that we may yet hope to dispel that almost universal feeling of dread experienced in the minds of patients by the idea of a visit to the Dentist.

THERAPEUTIC USE OF SANITAS.

In bringing together a record of the experiences of a few members of the Dental Profession with the antiseptic and disinfectant known as Sanitas, a few remarks upon its characters and chemistry may not be without interest. These latter details concerning Sanitas have been taken from the new (third) edition of "Stocken's Dental Materia Medica."

Characters.—This substance is obtainable in the form of an oil and an aqueous fluid. Sanitas oil is a yellowish-red oleaginous fluid, density about 975-950, slightly inflammable, volatile, and having an aromatic, camphoraceous odour. Soluble in alcohol and ether. Sanitas fluid is a watery solution, and may be diluted with water in any proportion.

Chemistry.—The products of the oxidation of oil of turpentine; the Sanitas oil containing camphoric peroxide and a substance which corresponds in all its properties with peroxide of hydrogen (H_2O_2) which is also one of the active principles of the aqueous fluid. The oil is said to possess oxidising powers equal to a ten volume solution of peroxide of hydrogen, and may be regarded as an extremely concentrated form of the aqueous solution or fluid. With potassium iodide, ferrous sulphate, and starch, it gives a strong reaction of peroxide of hydrogen.

Preparation.—By exposing a large quantity of turpentine floating upon water to a blast of hot air, the turpentine is oxidised and increased in density, giving rise to the production of camphoric peroxide, camphor, and various other substances of an oxidised nature. Some of these products, notably peroxide of hydrogen, camphoric acid and thymol, dissolve in the water forming the Sanitas Fluid. Floating upon the surface of the solution is the oxidised oil of turpentine, Sanitas Oil.

Therapeutic action and uses.—Antiseptic, disinfectant, and non-poisonous. Its antiseptic properties are chiefly due to the camphoraceous compounds, and its disinfectant or germicidal virtues depend largely upon the peroxide of hydrogen, or corresponding camphoric peroxide. Its antiseptic intensity is said to equal carbolic acid, thymol, and idoform, while, at the same time, it is neither caustic nor irritating. It is recommended as a dressing to wounds, ulcers, and suppurating surfaces; also, one part of fluid No. 1 to ten parts of water, as a gargle in ulcerated throat, or from ten to twenty drops to 1 ounce of water as a pleasant deodorising mouth wash.

The oil has been successfully used in the treatment of suppurating pulps and alveolar abscess, and the flavour is generally more agreeable than either carbolic acid or eucalyptus oil.

Mr. T. CHARTERS WHITE, M.R.C.S., L.D.S.Eng., writes:—I have found Sanitas oil very valuable dressing to pulps after the application of arsenic. I was led to the adoption of this agent from seeing its powerfully antiseptic effects in the preservation of meat and other animal substances, and it occurred to me that it might lead to the suppression of suppuration, after destroying the dental pulp. From my experience of its use I claim for it many advantages over carbolic acid, first, in not being caustic, and, secondly, patients find its flavour more agreeable than either carbolic acid or eucalyptus oil. I invariably now add Sanitas oil to my solution of chloroform and mastic, as cotton saturated with this mixture does not become so offensive when used as a temporary dressing. The ordinary solution of Sanitas, as kept by chemists for toilet use, furnishes a fluid which may be injected into the canals of teeth after the removal of the pulp, with most beneficial results, being a non-irritating antiseptic.

I might perhaps add, that in addition to the qualities I have mentioned, it is a valuable bleaching agent for many vegetable tissues for microscopical observation.

Mr. FRED BATE, L.D.S.Eng., House Surgeon to the National Dental Hospital, gives the following notes of a few cases treated with

Sanitas:—CASE I., *June 21st.*—A female, ætas 24 years, with an abscess at the root of the left upper lateral tooth, through death of the pulp from the laying open of the pulp cavity, consequent upon caries. The tooth was firm and tender, but pained considerably when pressed on the crown with the finger. The canal, loaded with ichorous pus, was cleaned out by a pledget of cotton wool steeped in Sanitas oil, and a barb dipped in the same oil passed up through apical foramen of the root (which had been enlarged by absorption) into abscess sac. This gave great pain; but after conveying Sanitas freely into the sac by several passings of the barb the pain ceased.

The canal was then dressed in the usual way, and the cavity filled with gutta-percha.

June 23rd.—Patient had had no recurrence of previous pain, and tooth was not tender when pressed with the finger. The gutta-percha was removed from the cavity; and the dressing taken out of the canal was found stained with further discharge, and giving off a fœted odour. The abscess sac was filled with the Sanitas oil, as before, giving very much less pain than on the previous occasion; showing, therefore, considerable reduction of inflammation. The canal was again dressed, and the cavity plugged with gutta-percha.

June 28th.—On the dressing being removed from the canal a light brown uniform stain, but no fœter, was present. The barb was passed into abscess sac, and withdrawn coated with a dark brown semi-fluid. The cavity was filled with gutta-percha after dressing the canal with Sanitas. The patient has not been since, but there is every reason to conclude that the tooth is doing well.

CASE II., *June 30th.*—A female, ætas 33 years, with left side of her face very much swollen, and ptosis of the left eyelid. On looking into her mouth pus was seen oozing round the neck of the left upper lateral tooth, and, it was said, had been discharging for three or four hours. The tooth was carious, but the pulp cavity was not open, and, owing to the great pain, could not be drilled into. The pus between the periosteum and the root was evacuated by pressing on the gum with the finger, in a downward direction, and Sanitas oil pumped up in its place. Wool, dipped in the oil, was placed in the cavity of the tooth, and a weaker solution given as a mouth-wash.

July 3rd.—The swelling, together with the pain, had entirely disappeared, and the left eyelid regained its normal movement. The tooth, being firm, the pulp cavity was opened and the dead pulp extracted. No pus came away; nor could any be evacuated from between the lining membrane of the socket and root of the tooth. Finally, the canal was dressed with Sanitas, and the tooth cavity plugged with gutta-percha.

CASE III., *August 9th.*—A female, ætas 24 years, with the left side of her face swollen and painful, and on the same side a sinus, situated at the lower border of the horizontal portion of the lower jaw, just below the anterior inferior angle of the masseter muscle, which looked fairly healthy, and was not discharging pus, but had been previous to the day patient was seen. Two left lower carious bicuspid teeth proved to have produced the mischief, for both teeth on removal were found to have abscess sacs attached to their roots; but that connected with the first was very much the larger. After extraction pus came away with a great amount of blood. Anodyne fomentations were ordered over the affected part, inside the mouth.

August 12th.—The left side of face more swollen and painful; the sinus puffy and a small quantity of pus escaping, but in the mouth a little pus came away after pressing the gum round the sockets of the extracted teeth. A blunt probe was passed to the bottom of the sockets, but no connection could be found between the opening on the face and that in the mouth. The latter opening was syringed with Sanitas and hot water, and kept patulous by a packing of lint soaked in Sanitas. In the former Sanitas was also injected, and a pad of lint placed over it, and a four-tailed bandage applied.

August 14th.—The dressings were removed. The opening in the mouth looked much better; no pus could be seen, and patient suffered no pain. The swelling on the face had gone down considerably; but the sinus was filled with thick pus, and the surrounding tissues, for about one half of an inch, were red and flabby. This opening was syringed with Sanitas; zinc ointment was smeared on the softened tissue externally; a pad of lint and four-tailed bandage applied as before.

There is now found to be a considerable amount of necrosed bone, some small pieces have come away, but there is yet a large surface denuded of periosteum and not movable. Therefore, the case still being under treatment, the entire history of it cannot now be given.

Mr. GURNELL HAMMOND, L.D.S.Eng., wrote in the *British Journal of Dental Science* for December 1st, 1881:—"Having thoroughly tried this new preparation during some six months as a dressing to diseased roots, I can speak most highly of its efficacy. Certainly it is one of the most powerful antiseptics and oxidants I have ever used; it appears to me superior even to eucalyptus oil, and it does not irritate in the smallest degree (unlike carbolic acid, creasote, etc.) any of the delicate tissues with which it may accidentally come into contact.

"The oil should be carried into the canal on a fibre of cotton wool, or better still, pumped up it with a fine broach on which a little floss silk has been twisted. The cavity should then be sealed up with wax, gutta-percha, or mastich for two or three days. I generally find one or two dressings to be sufficient, indeed, in a great percentage of cases treated with it (at the Western General Dispensary where I tried it first), the least trace of it on cotton was quite enough to render a bad root perfectly sweet.

"So much has been written lately on the antiseptic treatment of teeth, that I think this a favourable opportunity to call the attention of the Profession to this addition to our Dental pharmacopœia."

To the foregoing it may be added, as Mr. Hammond now writes, that he still employs Sanitas, and the only thing against it is its taste, or rather smell.

Mr. W. R. HUMBY, L.D.S.Eng., says the way in which I proceed to treat a suppurating pulp is, after applying the rubber-dam, to open the pulp-chamber and enlarge, if possible, the pulp-canal. Then with ropes of cotton dipped in warm water wipe out all the decomposed remains of pulp; and next, steep the cotton ropes in a solution of permanganate of potash, packing these in the canal and removing them until their colour is as bright a pink as when they entered. Now drying the cavity with an absorbent, and passing to the end of the root a rope saturated with chloroform, and again drying with an air syringe, I finally insert lightly a rope moistened with a weak solution of Sanitas, the crown cavity being sealed with a ball of cotton which the patient is directed to change each day for a week. At the end of that time I recleanse the root canal and pack in tightly a dressing of Sanitas, and secure it with a gutta-percha plug. In a fortnight after this second visit I fill the root canal and crown cavity with a solid filling. If there is a sinus through the gum one dressing is enough, as irritation from tension within the suppurating sac is not present. I have never found the foregoing method of treatment fail, nor the dressing offensive when removed.

I have tried a strong solution of Sanitas, and find that it caused irritation; I therefore think that the strength of the liquid should only be just enough to keep the dressing without septic change until the chances of an explosion are slight, and the contraction of the periosteum is secured.

In the same manner I have used eucalyptis oil, boro glycerine, and oil, gultheira or oil of winter green, and have found the first and last of these to act in ordinary cases equally as well as Sanitas; in fact, the winter green I prefer, as it does not clog or cause any irritation, while the endurance of the powerful and agreeable scent is very extraordinary. All the essential oils are said to act as antiseptics, from the presence of the peroxide of hydrogen, and this is claimed to be the special feature in the oxydised turpentine—Sanitas. I do not individually attach very much importance to the antiseptic I use, so long as it is selected from a *certain* class ; but what I do consider as of the utmost consequence, is the very thorough removal of that which originated the mischief (the dead pulp) and the subsequent preservation of the fluids which may afterwards enter the canal through the apical foramen, until it is considered safe to fill the root. The means employed to secure a clean pulp cavity in first case I am convinced is of more importance than the preservative used.

THERAPEUTIC USE OF HYDROGEN PEROXIDE

A Paper read before the American Dental Association.

By A. W. HARLAN, D.D.S., Chicago.

WHEN the treatment of alveolar abscess was under discussion before the Section on Diseases of the Teeth in the International Medical Congress, last Summer, Mr. Walter H. Coffin, of London, spoke of the use of hydrogen dioxide, and its efficiency in those cases where no fistulous opening was established, mentioning casually that by injecting the sac with this new agent it could be easily evacuated without coagulation of the contents or clogging the canals at the apices. After some ten months' quite constant use of this remedy, I am induced to present a few observations on the preparation of $H_2 O_2$, and the mode of using it.

As it is not always possible to obtain hydrogen dioxide of sufficient strength to be useful, the following is offered to enable those who may so desire to prepare it for themselves. To prepare hydrogen dioxide small portions of purified moist barium dioxide (binoxide of barium) are gradually added to a cold mixture of one part of sulphuric acid and five parts of distilled water, taking care to prevent the temperature from rising beyond 68° F., and suspending the addition when the liquid has only a slightly-acid reaction. The precipitated sulphate of barium is allowed to deposit, and the liquid is filtered off. It is best to retain the slight excess of sulphuric acid, since the compound keeps better by so doing. The solution thus obtained, which scarcely ever contains over five per cent. of hydrogen dioxide, may be concentrated either by exposing it, *in vacuo*, over sulphuric acid, at a temperature of 59° to 68° F., or it may be exposed to cold and frozen, and the frozen portion removed. The residuary liquid by the latter process will be much more concentrated than that by the former, as hydrogen dioxide does not freeze even at —30° F. If the solution is allowed to evaporate over sulphuric acid, it may happen that bubbles of oxygen will begin to be given off. In this case, the addition of a few drops of sulphuric acid will arrest further decomposition.

The aqueous solution, if not too strong, can be preserved for months if it is kept in a cold place, not exposed to light. Hydrogen dioxide is easily soluble in ether. If the aqueous solution is shaken with ether, the latter dissolves out the dioxide. The ethereal solution is much more stable than the aqueous, and may even be distilled without decomposition. An easy test for determining the quantity of hydrogen dioxide present in any aqueous solution may be made by strongly acidulating the liquid with sulphuric acid, and adding from a burette a solution of potassium permanganate of known strength until the purple tint of the latter is no longer destroyed. In this case the following reaction takes place:

$$\underset{\text{Potassium Permang.}}{K_2Mn_2O_8} + \underset{\text{Sulphuric Acid.}}{3H_2SO_4} + \underset{\text{Hyd. Diox.}}{H_2O_2} =$$

$$\underset{\text{Potas. Sulphate.}}{K_2SO_4} + \underset{\text{Mang. Sulphate.}}{2MnSO_4} + \underset{\text{Water.}}{4H_2O} + \underset{\text{Oxygen.}}{3O_2}$$

Each grain of potassium permanganate used corresponds to 0·108 grains of hydrogen dioxide.

During the past year, in general medicine, renewed attention has been drawn to this agent, and the most extraordinary curative effects have been attributed to it, with what propriety the future will show. It is, for instance, stated that "no physician who has only once tried hydrogen dioxide applied in spray to suppurating eyes or suppurating wounds will ever want to be without it." "Passing a few times across a sick chamber while projecting a spray of a two-per-cent. solution renders the air odourless and pure, etc." To show its antiseptic properties, Guttman mixed nine parts of urine with one part of dioxide and allowed it to remain nine months, and it did not putrefy. MM. Béchamp and Paul Bert have, by a series of experiments, discovered that oxidized water arrests fermentation from the presence of living organisms, but is inert in the presence of amorphous ferments, such as diastaste, saliva, pancreatic juice, etc. As it is not improbable that the compound will be more frequently experimented with than before these later investigations, some statements contained in a recent circular of H. Zommsdorf, the well-known manufacturer of chemicals at Erfurt, Germany, will be of interest. He says: "It is occasionally stated that distilled water can contain 'ten volumes of hydrogen dioxide;' this is wrong, and is due to an erroneous conception of the words 'ten volumes' which is attached to the quotation of the article in the price-lists. Hydrogen dioxide in its pure state is a *liquid*, and not a gas, and the 'ten volumes' is meant to convey that the product contains ten volumes of available oxygen,—or, in other words, one measure of the commercial liquid can give off ten measures of oxygen. This corresponds to a three-per-cent. solution of hydrogen dioxide. A 'two-volume' solution would be one which gives off twice its volume of oxygen,—or which contains 0·6 per cent. of H_2O_2. Most of the peroxide of hydrogen in the market is little more than a solution of commercial barium dioxide in dilute hydrochloric acid, and possessing but feeble keeping qualities." At present Zommsdorf's product contains three per cent., or varies but a trifle from that figure. It must be kept in a cold, dark place, in glass-stoppered bottles, which should be small if the consumption of the article is insignificant.

I have always used the aqueous solution in the treatment of blind alveolar abscesses and pyorrhea alveolaris, as I have found the rapid evolution of the oxygen to effect a thorough evacuation of the pus. One may see the thin, frothy contents of a non-fistulous abscess—even though the tooth is in the lower maxilla—gradually escape from the sac beneath, if this agent is used thoroughly. Hydrogen dioxide is such an unstable compound that it immediately decomposes when exposed to the air or is brought into contact with the contents of the sac, liberating oxygen, which unites with the pus and causes it to escape. The unsatisfied molecules of oxygen mechanically distend the sac, thus forcing the pus from it, and thereby causing its complete evacuation. Such an agent must commend itself to any one for the simplicity of its working, as a ready and efficient means of accomplishing so difficult an undertaking as the removal of pus from around the apex of a lower cuspid or bicuspid, without creating any unpleasant after-effect. In practice, after opening the canal, I at first very gently wash out the canal from whence the pus is oozing, and afterwards carefully inject the remedy into the sac, which is immediately distended by the evolution of oxygen, and the complete evacuation of its contents follows. I then introduce strands of cotton saturated with volatile eucalyptus, and tightly seal the cavity. The dressing is to be changed in three days, when, if there is no pus or odour, the canal is to be packed tightly with cotton moistened as before, and sealed with gutta-percha. In a week or ten days the root may be filled, leaving the cavity of decay to be filled when convenient. In some cases it may be necessary to use hydrogen dioxide two or three times, at intervals of three or four days, in order to arrest the production of pus. It is always necessary to adjust the rubber dam over the tooth while treating it or changing the dressing. I prefer the volatile eucalyptus as the after-dressing, on account of its not being escharotic or irritating to such a surface as is presented after the use of $H_2 O_2$.

These brief observations are not offered for the purpose of discouraging the so-called "radical" treatment of latent abscesses connected with teeth, but to place in the hands of careful and delicate manipulators a remedy which will prevent much suffering to the patient if used intelligently. I venture to suggest that $H_2 O_2$ may become useful as a bleaching agent for discoloured teeth, as it is now largely used in the arts for bleaching; but, so far, I have not tried it for that purpose. Other uses of this new agent will, doubtless, suggest themselves—a remedy which, I hope, is to become a valuable addition to our too slender list of efficient therapeutical agents.—*Dental Cosmos.*

GOLD FILLINGS.

WRITING in the *Ohio State Journal of Dental Science* on the subject of Gold Fillings, A. A. Blount, M.D., D.D.S., says: I will describe my present method of manipulating in as few words as possible.

The most important part of the operation of filling a tooth, in my judgment, is the preparation of the cavity. Introducing the gold is a simple and easy matter, if the cavity is properly prepared to receive it. We will take, for example, an approximal cavity; cut the cervical border as flat and level as it is possible to make it, inclining a little towards the tooth, the lateral walls perpendicular and slightly dovetailed, terminating in acute angles with the cervical wall, which answers for retaining points, the back of the cavity flat. To fill this cavity, place a sufficient quantity of soft, or unannealed gold upon the cervical wall to completely cover it, and serve as a cushion, on which lay the cohesive, condensing well into the angles; cover the whole surface with cohesive foil till it is securely anchored. Now, with a smooth point and light taps of the mallet, condense well over the border, cut away the surplus gold, and that part of the filling is finished. Place a pellet of soft foil against the lateral wall, overlap this with a pellet of cohesive—tacked on to the foundation already laid—another pellet of soft, overlapped by another pellet of cohesive, and so on till the side walls are covered; place a pellet of soft foil, large enough to cover the back of the cavity, condensing lightly by hand pressure, secure this by cohesive foil packed into the angles formed by the lateral walls with the back, with a smooth point condense down on to, and slightly overlap the borders, and the operation of lining is completed, and ready for the superstructure whatever it may be. Many beautiful operations may be made by fitting a piece of an artificial tooth, so as to hide the rim of gold, cemented in by any of the plastic cements, without any apprehension on the part of the operator, of the washing away of the cement, and subsequent decay of the borders.

FRUGIVOROUS, CARNIVOROUS, OR OMNIVOROUS?

A CORRESPONDENT, writing to a lay contemporary upon the adaptation of the dentition and digestive organs of man for a vegetable rather than a flesh diet, says:—

Man belongs to that class which is termed by naturalists *gregarious*, and like all other animals of that kind is naturally frugivorous. Nor does this assumption rest on the analogy observable between man and other gregarious species alone, for it is supported by the construction of his nutritive organs. Carnivorous species possess teeth peculiarly formed for the tearing and masticating of flesh food. The canine teeth are sharp, largely developed, and curved; as are also the incisors. The molars, or rather the teeth which take the place of molars, are edged and sharp, and close side by side like a pair of shears, or scissors. Thus we see that this dentile apparatus is well adapted to tearing and cutting the flesh before it passes into the stomach.

On the other hand, the teeth of frugivorous animals consist of incisors and molars. It is true that the canine teeth exist; but they are not sufficiently developed to distinguish them from incisors, as in the carnivorous species. The molars are nearly flat at the end, and come into direct contact like two milling-stones, and are caused, by a small lateral motion, to grind the food that passes between them. It will be seen that this operation is all that is required for the mastication of vegetable, but not animal food.

Anyone will discover that the last description of dentile apparatus is synonymous with the human teeth. As far as they are a guide to man's proper food, no other conclusion should be arrived at than that they are intended for the mastication of vegetable food, and that man should be frugivorous.

This evidence is not alone; for if we examine the digestive apparatus, we find there similar evidence: or, I should say, evidence supporting the same end. In the carnivorous species the intestine is only about three or four times the length of the body, through which the food passes; but in the herbivorous classes it is not unfrequently ten or twelve times the length of the body. In the sheep the intestine is actually twenty-eight times the length of the body! Thus we see that the human intestine, like the teeth, is suited to vegetable aliment, seeing that it has a length in proportion to the body corresponding with other frugivorous species. How then is it that man is omnivorous? The answer is evident. We cannot eat animal food unless it is cooked; and even then it is not his natural, or would appear not to be his natural, food. According to the Divine Book the early inhabitants of the world ate of the fruits of the earth only, and not of the flesh until God issued the fiat, "Every moving thing that liveth shall be meat for you." Man, however, appears to have been created as a vegetarian. The fiat was accompanied by an order to bleed the animal; but nothing is said about the cooking, and no one can repudiate the greater applicability of our organs to vegetable food. Of course, it must be assumed that our forerunners discovered at once that the food must be cooked to be efficacious and digestible!

THE FOOD AND ENERGY OF MAN.

Abstract of a lecture delivered at the Sanitary Congress, at Newcastle-on-Tyne, September 28th.

By Prof. F. S. B. De Chaumont, M.D., F.R.S.

The question has been much discussed as to what the original food of man was, and some people have made it a subject of excited contention. The most reasonable conclusion is that man is naturally a frugivorous or fruit-eating animal, like his cousins the monkeys, whom he still so much resembles. This forms a further argument in favour of his being originated in warm regions, where fruits of all kinds were plentiful. It is pretty clear that the resort to animal food, whether the result of the pressure of want from failure of vegetable products, or mere taste and a desire for change and more appetising food, is one that took place many ages ago, probably in the earliest anthropoid if not in the latest pithecoid stage. No doubt some advantage was recognised in the more rapid digestion and the comparative ease with which the hunter or fisher could obtain food, instead of waiting for the ripening of fruits in countries which had more or less prolonged periods of cold and inclement weather. Some anatomical changes have doubtless resulted from the practice, but they are not of a sufficiently marked character to found much argument upon; all that we can say being that the digestive apparatus in man seems well adapted for digesting any food that is capable of yielding nutriment, and that even when an entire change is made in the mode of feeding, the adaptability of the human system shows itself in a more or less rapid accommodation to the altered circumstances. Food, then, is any substance which can be taken into the body and applied to use, either in building up or repairing the tissues and framework of the body itself, or in providing energy and producing animal heat, or any substance which, without performing those functions directly, controls, directs, or assists their performance. With this wide definition it is evident that we include all the ordinary articles recognised commonly as food, and that we reject all substance recognised commonly as poisons. But it will also include such substances as water and air, both of which are essential for nutrition, but are not usually recognised as belonging to the list of food substances in the ordinary sense. When we carry our investigation further, we find that the organic substances may be again divided into two distinct classes, viz., that which contains nitrogen (the casein), and those that do not (the butter and sugar). On ascertaining this we are immediately struck with the remarkable fact that all the tissues and fluids of the body, muscles (or flesh), bone, blood—all, in short, except the fat—contain nitrogen, and, consequently, for their building up in the young, and for their repair and renewal in the adult, nitrogen is absolutely required. We therefore reasonably infer that the nitrogenous substance is necessary for this purpose. Experiment has borne this out, for men who have been compelled to live without nitrogenous food by dire necessity, and criminals on whom the experiment has been tried, have all perished sooner or later in consequence. When nitrogenous substances are used in the body, they are, of course, broken up and oxidised, or perhaps we ought to say, more accurately, they take the place of the tissues of the body which wear away and are carried off by oxidation and other chemical changes. Now, modern science tells us that such changes are accompanied with manifestations of energy in some form or other, most frequently in that of heat, and we must look, therefore, upon nitrogenous food as contributing to the energy of the body in addition to its other functions. What are the substances which we may class as nitrogenous? In the first place, we have the typical example of the purest form in *albumin*, or white of egg; and from this the name is now given to the class of *albuminates*. The animal albuminates are: Albumin from eggs, fibrin from muscles or flesh, myosin, or synronin, also from animals, casein (or cheesy matter) from milk, and the nitrogenous substances from blood. In the vegetable kingdom, we have glutin, or vegetable fibrin, which is the nourishing constituent of wheat, barley, oats, etc.; and legumin, or vegetable casein, which is the peculiar substance found in peas and beans. The other organic constituents—viz., the fats and the starches and sugars—contain no nitrogen, and were at one time thought to be concerned in producing animal heat. We now know—thanks to the labours of Joule, Lyon Playfair, Clausius, Tyndall, Helmholtz, etc.—that heat itself is a mode of motion, a form of convertible energy, which can be made to do useful or productive work, and be expressed in terms of actual work done. Modern experiment shows that all our energy is derived from that of food, and, in particular, from the non-nitrogenous part of it, that is, the fat, starch, and sugar. The nutrition of man is best maintained when he is provided with a due admixture of all the four classes of aliment which we have mentioned, and not only that, but he is also better off if he has a variety of each class. Thus he may and ought to have albumin, fibrine, glutin, and casein among the albuminates, or at least two of them ; butter and lard, or suet, or oil among the fats ; starch of wheat, potato, rice, peas, etc., and cane-sugar and milk-sugar among the carbo-hydrates. The salts cannot be replaced, so far as we know. Life may be maintained in fair vigour for some time on albuminates only, but this is done at the expense of the tissues, especially the fat of the body, and the end must soon come; with fat and carbo-hydrates alone vigour may also be maintained for some time, at the expense of the tissues also, but the limit is a near one. In either of these cases we suppose sufficient water and salts to be provided. We must now inquire into the quantities of food necessary; and this necessitates a little consideration of the way in which the work of the body is carried on. We must look upon the human body exactly as a machine ; like an engine with which we are all so familiar. A certain amount of work requires to be done, say a certain number of miles of distance to be traversed. We know that to do this a certain number of pounds, or hundredweights, or tons of coal must be put into the fire of the boiler in order to furnish the requisite amount of energy through the medium of steam. This amount of fuel must bear a certain proportion to the work, and also to the velocity with which it is done, so both quantity and time have to be accounted for.

No lecture on diet would be complete without a reference to the vexed question of alcohol. I am no teetotal advocate, and I repudiate the rubbish too often spouted from teetotal platforms, talk, that is, perhaps, inseparable from the advocacy of a cause that imports a good deal of enthusiasm. I am at one, however, in recognising the evils of excess, and would gladly hail their diminution. But I believe that alcohol properly used may be a comfort and a blessing, just as I know that improperly used it becomes a bane and a curse. But we are now concerned with it as an article of diet in relation to useful work, and it may be well to call attention markedly to the fact that its use in this way is very limited. The experiments of the late Dr. Parkes, made in our laboratory at Netley, were conclusive on the point, that beyond an amount that would be represented by about one-and-a-half to two pints of beer, alcohol no longer provided any convertible energy, and that, therefore, to take it in the belief that it did do so is an error. It may give a momentary stimulus in considerable doses, but this is invariably followed by a corresponding depression, and it is a maxim now generally followed, especially on service, never to give it before or during work. There are, of course, some persons who are better without it altogether, and so all moderation ought to be commended, if not enjoyed. There are other beverages which are more useful than the alcoholic, as restoratives and for support in fatigue. Tea and coffee are particularly good.

Another excellent restorative is a weak solution of Liebig's extract of meat, which has a remarkable power of removing fatigue. Perhaps one of the most useful and most easily obtainable is weak oatmeal gruel, either hot or cold. With regard to tobacco, it also has some value in lessening fatigue in those who are able to take it, but it may easily be carried to excess. Of it we may say, as of alcohol, that in moderation it seems harmless, and even useful to some extent, but, in excess, it is rank poison.

THE COMPOSITION OF COMMERCIAL FOODS.

THE *Centralbl. f. Allgem. Gesundheitspflege* contains the results of an analysis by Stütze of a number of commercial foods, breads, biscuits, prepared meal, etc. We cite a few of these :—

	Digestive albumen.	Fat.	Carbo-hydrate.	Water.	Salts.	Alcohol.	Carbo-hydrate with extractive (glycerine, etc.)	Extractive (creatin, etc.)
Prepared oatmeal	9.12	7.10	72.51	10.3	0.95			
Nestle's food	9.9	5.16	79.30	4.17	1.4			
Fresh white bread	7.20	0.28	60.76	30.2	1.48			
Hoff's malt extract	0.28	..	..	91.29	0.13	1.20	7.10	
Linck's malt extract ..	2.50	..	63.46	33.11	0.93			
Cacao (Lobeck's)	4.16	33.4 (!)	52.00	6.55	3.78			
Ordinary lean beef	18.53	3.45	..	74.26	1.17	..	..	2.51
Liebig's extract of meat ..	3.40	..	..	19.57	23.18	..	..	53.85
Anglo-Swiss condensed milk	8.79	10.45	54.22	24.79	1.75			

A pound of lean beef contains about as much digestible albumen as fifteen hen's eggs. The following instructive table shows the change in making soup by boiling lean beef in water with salt for four hours :—

	Left over in the soup.		Remaining in the meat.
Digestible albumen	1.51	..	17.02
Fat	0.52	..	2.93
Extractive (chiefly creatin)	2.29	..	0.30
Salts	0.82	..	0.35
Phosphoric Acid	0.318	..	0.187

—*Sanitary Record.*

LIGHT—VISION.

Nowhere are good light and correct vision more important than in the examination of and operations upon the natural teeth. In many places it is impossible to have clear and unobscured light. In any place, even the most favourable, there will be sometimes a hazy, or smoky, or a cloudy atmosphere. Some localities are subject to these disabilities in a much greater degree than others. Large cities, and indeed small ones, that are compactly built have defective light, being most of the time somewhat obscured by smoke, vapours and buildings, and under such circumstance the light is exceedingly variable.

Marshy localities will have a hazy atmosphere, much more than the higher, drier, and hilly places. The state of the atmosphere and the surroundings are important elements in estimating for good light. Light from the north is preferable to that from any other quarter, chiefly because it is more uniform and more steady; light from other quarters is often used, but is never so satisfactory. It is true that screens and shades may be used to cut off an excess of light, but these do not meet the fluctuations that are so frequent in light from east, south or west. Having a good light, the next point is its management, or rather, making it most available and efficient. In every instance the rays of light should come upon the point of observation as directly as possible. It is not practicable to place all the localities in the mouth requiring an operation in the same position, in respect to the rays of light, at least as they are usually admitted. But arrangements in buildings are sometimes so made as to make the light available all the way from the zenith to the horizon; this is accomplished by inclined windows and sky-lights. The latter gives special advantage in operations upon the inferior teeth; but there are disadvantages that perhaps overbalance. The light from the zenith is not as desirable as that from the horizon to a point midway to the zenith; and, again, the cross-rays from a skylight and a vertical window are very objectionable; if both are present it is almost a necessity to obscure the one while the other is being used. In operations upon the lower teeth the reflector, either in the mouth or out of it, and especially with a little condensing power, can be made to more than compensate for the skylight.

The best arrangement is a good vertical window with pure crown glass extending to eighteen to twenty inches of the floor, three feet wide, and the height just sufficient for the patient, when seated and the head in position for an operation upon the upper molars, to see just above the midway-point between the horizon and the zenith. The window should have two equal sections of inside blinds, one above and one below; each section should be divided into two, of three leaves each, hinged together, this arrangement puts the amount of light entering the window under perfect control. There should be no side window near the chair; every chair, however, should have a rotary movement. The light in an operating room should be considerably less than that outside.

The management of light near and in the mouth is a matter of importance and one requiring considerable tact. Several sizes and forms of reflectors should be at hand, nearly all of which should have more or less of condensing and magnifying power. By means of these light can be thrown into obscure places, and increased by condensation as may be desired. Magnifiers of various sizes and power should always be at hand, these in many instances may be used for light condensers; for this purpose, however, they are only available when the light falls directly upon the point of observation. Of the various arrangements for magnifiers there is, perhaps, none more common or more effective than properly adjusted eye-glasses. Still, it is questionable whether those who have good, unimpaired eyesight, should accustom themselves to glasses constantly while operating, but the occasional use of the glass in some form as a magnifier is almost a matter of necessity.

The importance and value of good light and its proper management in dental practice is strongly emphasized, when we consider that the wonderful revelations made by the microscope, is by good light and its skilful management, through the use of the most perfect machinery and appliances.

By the various aids, to vision, that are available, much may be learned of the structure, condition, and defects of the various tissues with which we have to do; and not only this, but the operations performed will be more thoroughly accomplished under a stronger and more penetrating vision than can be obtained by the unaided eye. Material defects in dentine and enamel, especially the latter, often exist that can only be made apparent by concentrated light and a glass of good definition. The things that ought to be seen and correctly estimated in every tooth that is filled, are—1st, The structural quality of the tissue. 2nd, The congenital defects, as shown in fissures, imperfect or open tracts through the enamel, atrophy, spots, pits or grooves in the enamel. 3rd, The accidental defects, such as fractures, checks, and change of colour. 4th, The minute roughness and irregularities upon the surfaces of the teeth, and in cavities that are to be filled, especially in the borders. 5th, The particular appearance of decay as exhibited in the different varieties, and the various stages of each.

The faculty of observation varies greatly in different persons; some see everything, others comparatively little. Some see finely, others coarsely. The impressions made by observation upon some are permanent, upon others of very short duration.

The faculty of close and effective observation is an important one to the Dentist, one in which many are deficient. It is one, however, susceptible of improvement by proper cultivation, and every one should see to it that this part of his education is not neglected. It should also be kept in mind that in this particular each one is his own teacher.—*Dental Register.*

HAIR AND ALLIED STRUCTURES.

In a paper read before the Microscopical Society of Liverpool, Mr. F. T. Paul, F.R.C.S., President-elect, said that as the subject was a very wide one, he would limit his remarks to a consideration of the morphological relations of the various tegumentary appendages which must be regarded as allied to hair. The structures which were included in this general association were of the most opposite character, but were uniform in the possession of certain common qualities of a protective or attractive nature. After a few general remarks upon the adaptation of the external covering to the requirement of the individual, showing the combination of as much attractive beauty as was consistent with the welfare of the species, the development of the skin in vertebrate animals was described. Special attention was called to the history of the two layers of which it is composed, showing their separate origin and their different character throughout life—that the epithelial layer may be modified to form horny or calcified tissues, and the connective tissue layer to form bone, ivory, cartilage, muscle, nerve, etc., so that where complicated structures like teeth, spines, feathers, and so forth were produced, they always knew what share each layer had taken in their formation, because they knew to begin with what modification each layer was capable of undergoing. The appendages were divided into two classes— those developed from comparatively large areas of skin tissue, such as nails, claws, hoofs, horns, scutes, and beaks, and those developed from a small bud or germ from the epithelial layer, such as hair, feathers, scales, spines, teeth, and glands. The developmental relations of the first class were then considered, and special reference was made to the fossil remains of birds that have recently been discovered and described by Professor Marsh, of America, in which there is a full set of reptilian teeth in the beak or jaw, which, together with the abortive germs in some existing species, and the serrated beaks of fossils and recent birds, show a gradual change from the reptilian jaw to the present beak. Taking the second class, fish scales are omitted as too large a subject to be compressed into one paper; but the development of the hair, the various phases of its life-history, its decay and reproduction, were fully considered; and the microscopical characters of the most striking varieties of hair were illustrated. Attention was called to the character of the papillæ, and the effect of its modifications in size, shape, and position in producing special kinds of hair—size, shape, curling, etc.; but more particular allusion was made to the extremely complex nature of the papillæ which inspire the extraordinary combination of cells resulting in the production of a perfect spine or feather. A short account was given of the glands of the skin, especially in such animals as the naked amphibians, in which they act as weapons of defence by pouring out an acrid secretion which is obnoxious to the palate of some of those animals that are naturally disposed to prey upon them. The paper concluded with some suggestions for preparing these tissues for the microscope.—*World of Science.*

MALIGNANT DISEASE OF TONSIL.

At a meeting of the Clinical Society on the 13th ult., Mr. Golding Bird detailed a case in which he had removed an Epitheliomatous Tonsil in the manner adopted by Cheever (1871), and referred to three other cases of the same disease in which he had determined not to operate. The operation consisted in an external incision from the ear to the hyoid bone, through which the wall of the pharynx was reached with the greatest ease, and the tonsil with the adjacent pharyngeal tissue removed with the galvanic cautery. The later stages of the operation were aided by an additional incision through the cheek from the angle of the mouth. The disease having also affected the tongue, part of that organ was removed as well as an enlarged gland at the angle of the jaw. Until the wound closed an œsophagus tube was used for feeding, and though great relief was given to the patient, yet he soon succumbed to recurrence, not in the site of the excised organ, but in the tongue and in the lymphatics of the neck. The conclusions arrived at by the author were that where only a limited infection of the lymphatic glands existed, and where the faucial growth was circumscribed, or nearly so, operation was called for; but that in other cases feeding with tubes with subsequent gastrostomy was the treatment. The operation was itself far easier than many of daily occurrence, and seemed to offer no special risk to the patient. Of the four cases mentioned it was considered by Mr. Golding Bird that the disease was primary in the tonsil in three, in all four it was the left side that suffered.

Mr. Clement Lucas related a case of Excision of the Base of the Tongue, Right Tonsil, and part of the Left Palate for Epithelioma. The patient, aged sixty-four, a coalporter on the riverside, who had drunk freely, first came under Mr. Lucas's care in Guy's Hospital on February 13th, 1880. He was at that time suffering from a large aneurism of the right popliteal artery, causing pain and œdema of the leg and foot, and from a smaller aneurism of the left popliteal. Digital compression of the right femoral artery was commenced on Feb. 17th, and continued for sixteen hours, when the aneurism appeared to have consolidated, and pulsation could no longer be detected. On the following day some pulsation was re-established, and on the 20th digital compression was again commenced, and continued for eleven and a half hours, when pulsation ceased and did not recur, the tumour afterwards gradually shrinking. An attempt was made about a fortnight later to cure the small aneurism in the left popliteal space by digital compression, but this failed, and as the tumour caused him little inconvenience, no further treatment was suggested, and he left the hospital. He was readmitted on August 2nd, 1881, suffering from epithelioma of the base of the tongue and right tonsil. On the right side of the tongue, opposite the last molar tooth, was a small ulcer, grey in colour, and irregular on the surface. The ulceration extended along the anterior pillar of the fauces, and involved the right tonsil as well as the tissue between the tongue and the jaw. The surface of the tongue near the base was raised and indurated for about half an inch from the margin of the ulcer. The movements of his tongue were interfered with, so that mastication and deglutition were painful, and there was an increase of salivary secretion. No enlarged glands were felt beneath or behind the jaw. The operation was performed on August 9th. The patient being placed under the influence of chloroform, the cheek was first divided by an incision from the angle of the mouth to the masseter muscle, and the facial artery was twisted. A gag was then inserted on the left side of the mouth whilst the tongue was drawn forward with forceps, and the flaps of the cheek were held back by retractors. The back of the tongue and tonsil were in this way easily reached. The soft palate was next divided near the middle line by means of Paquelin's cautery, and dissected down with the anterior pillar and the tonsil. Attention was now paid to the tongue, which was divided in the median line with a scalpel, and carefully dissected outwards till the lingual artery was reached. This was seized with two pairs of torsion forceps, divided between, and the ends twisted without loss of blood. The tissue between the tongue and jaw was next dissected up, the cautery being used to stop any bleeding points, and finally the growth, with the base of the tongue, right tonsil, and half the soft palate, was removed in one mass. The cheek was brought together with three harelip pins, and it united primarily. The patient recovered rapidly after the operation, and sixteen days later was again subjected to digital compression for the cure of the left popliteal aneurism, which was about the size of a pigeon's egg. Pressure was kept up with the aid of opium for forty-eight hours, but soon after this, though much consolidated, the tumour still pulsated. He left the hospital, with the tongue quite healed, on September 16th. He was readmitted into the hospital on February 13th, 1882. There was no return of the disease in the tongue or palate, which were united by a firm and sound cicatrix. There was a large mass on the right side of his neck below and behind the jaw, which commenced six weeks before, and grew rapidly, extending outwards beneath the sterno-mastoid. An operation for the removal of this growth was undertaken on the following day. A vertical incision about four inches in length was made, commencing behind the jaw, and the growth dissected round. It was found necessary afterwards to enlarge the wound transversely. In the course of the operation the lower part of the parotid gland, a portion of the sterno-mastoid, the posterior belly of the digastric and stylo-hyoid, and a portion of the submaxillary gland were removed, all of which were infiltrated. The facial artery was twisted, and the facial and lingual veins ligatured with catgut. At the bottom of the wound the internal jugular vein and the two carotids, with the hypoglossal nerve, were exposed. Two enlarged glands were also removed from beneath the sterno-mastoid. The patient recovered without a bad symptom, and left the hospital on March 24th. He was again seen in July last with a recurrence of the growth on both sides of the neck, but there was still no sign of disease in the original site. It was not then thought advisable to interfere further. Mr. Lucas said that, by the operation described, it was evident a cancerous tonsil, with the adjacent structures, can be completely removed from within the mouth, and when this was practicable, it had the advantage over the external operation of avoiding the fistulous track, through which saliva was apt to ooze. For the rest, the treatment of cancer here did not differ from the treatment of it elsewhere. The treatment—and the only treatment—was to operate early, and to operate late; to operate, indeed, so long as it was possible to remove a loathsome outgrowth without great immediate danger; to operate to keep it local; to operate on the earliest return; and though we might often be disappointed in our attempts to eradicate the disease, we might still prolong life, or, as in the case before us, succeed in driving the disease from its original site to one where it was less offensive, and more easy for the patient to bear.

Mr. C. Heath congratulated Mr. Golding Bird and Mr. Lucas on their bold procedure. Dr. Cheever's operation must of necessity be of great difficulty, but was successful in his and Mr. Golding Bird's hands. But the question arose as to whether good was done by such an operation. His own view was that, whenever the surgeon can get beyond the cancerous disease, an operation was justifiable, even when the growth was in the lymphatic gland; but the opinion was often given by eminent surgeons that cancerous disease of lymphatic glands was a bar to operation. He should therefore be glad to know what the general opinion was.

Mr. MORRANT BAKER thought that Mr. Lucas was very successful in the long period that elapsed without local recurrence. He asked if the part was removed with the écraseur or with the scissors, after Mr. Whitehead's method. He had himself used in many cases the écraseur, to prevent hæmorrhage and lessen pain. He quite concurred with Mr. Heath in advocating the removal of cancerous lymphatic glands where they could be completely removed.

Mr. BUTLIN thought removal of the tonsil through a deep wound on the neck was hardly worth doing, although possibly justifiable. Cheever had had two cases, and Czermak had had one, but in all there was rapid recurrence. As a result of his researches, he found that the only case of malignant disease of the tonsil really improved by operation was one of lympho-sarcoma, removed through the mouth, in which there was freedom from recurrence for two years at least; and he rather doubted whether there was not some error in the diagnosis in this case, as it was extremely difficult to distinguish a lympho-sarcoma from an ordinary enlargement of the tonsil.

Mr. LISTER said there was no doubt of the boldness and skill of the operators in the cases related. But he feared that, on the average, operative interference was more likely to be harmful than beneficial. Mr. Lucas's case was very successful and favourable. He asked for a more detailed account of the last step of this operation. He was glad to know that surgeons now generally removed cancerous lymphatic glands when accessible; this was quite a change since he was a student. He believed he was the first person to clear out an axilla in cases of scirrhus of the mamma, and he had had reason to be very well pleased with his results. In a case of epithelioma of the lip and a single enlarged gland under the chin Mr. Syme used to operate, and with good results, although at the time he deprecated such operations where glands were affected in other situations.

Mr. GOLDING BIRD'S opinion was distinctly in favour of not operating in cases of cancer of the tonsil.

Mr. CLEMENT LUCAS said that in his case the tongue was divided entirely with the knife. The soft palate and tonsil were first dissected down, then the tongue was dissected up, and the mass to be removed was carefully divided, and any bleeding point was touched with a Paquelin's cautery. He thought his case showed that such operations were not hopeless, for he had freed the man from the loathsome disease in the mouth, and he was now suffering from a far more tolerable affection in the neck.—*Lancet.*

HÆMORRHAGE AFTER EXCISION OF THE TONSIL.

THE removal of an hypertrophied tonsil is a frequent and simple surgical operation, in connection with which any complication is so infrequent as to be unheeded by many operators. Experience abundantly proves, however, that it is not unattended with danger from hæmorrhage, one of the most serious features of which is that it may not be primary but intermediary, or what is usually spoken of incorrectly as "secondary." There may be only the usual slight amount of hæmorrhage at the time, and then some hours later a profuse flow of blood occurs. This fact it is which gives additional import to the complication. Dr. Lefferts, of New York, has recently drawn attention to this subject, and has recorded cases in which the bleeding has been profuse, and discussed the appropriate treatment. In this country, we believe it is a not infrequent plan to give every patient an astringent powder to be moistened with water and introduced into the back of the throat should bleeding come on. Dr. Weir has recently recorded a case of this intermediary hæmorrhage, which illustrates well one cause of it, and the explanation of its mode of occurrence. One tonsil of a young man was removed with a guillotine; there was slight hæmorrhage at the time, but several hours afterwards severe loss of blood—estimated at a pint—ensued, which was controlled by the application of persulphate of iron and by pressure; the bleeding recurred twice subsequently. When Dr. Weir saw the patient he found that the bleeding vessel was an artery in the anterior pillar of the fauces. The vessels of the tonsils are small and lie in soft tissue, which readily permits of their natural closure when severed, and the various movements of the throat do not of themselves disturb the wounded vessels. Not so is it with the palatine arteries; they are, in the first place, larger, and, as they lie in the muscular tissue of the palate, when wounded they are constantly exposed to disturbance from the contractions of the palate muscles in deglutition. If one of these vessels be wounded then, in the operation of excising the tonsil, not only is the hæmorrhage freer than from the tonsillar vessels, but there is a great tendency to recurrent bleeding from the constant movements to which the wounded vessel is exposed.—*Lancet.*

ABSCESS OF THE PAROTID GLAND.

MR. ANDREW CLARK reports the following case in the *Lancet*—A. G——, aged fifty, first came on May 18th, 1882, with considerable enlargement about the right parotid, which she stated had been coming for several months. It was in the main hard, but there were several soft fluctuating nodules projecting from it; there was some enlargement of the submaxillary lymphatic glands and several carious teeth, but of these the patient did not complain. The diagnosis was between glandular abscess affecting the right parotid and enchondroma of the parotid. A mixture of carbonate of ammonia and chinchona was ordered, and locally an ointment of belladonna and iodide of potassium was applied. For the next two or three weeks the swelling continued to get harder and larger, and it was not until August 31st that it burst, and then it rapidly disappeared, leaving a small discharging sinus. The patient always declined to have anything done to her teeth.

OUR ORIGIN AS A SPECIES.

THE first number of *Longman's Magazine*, to whose prosperity we wish well, contains an article by Professor Owen with the above title, and which is a polemic upon a paper by Grant Allen in a late number of the *Fortnightly*. That author had rather strongly insisted on the evolution of man from some man-like animal developed from the anthropoid apes, and living about the mid-miocene period; a creature that was partly frugivorous, partly carnivorous—a tall and hairy creature more or less erect, but with slouching gait, black-faced and whiskered, with prominent prognathous muzzle and large pointed canine teeth, those of each jaw fitting into an interspace in the opposite row; the forehead low and retreating, with bony bosses underlying the shaggy eyebrows; his brain about halfway between that of the anthropoid apes and that of the Neanderthal skull. Then came the Pleistocene period, and with it the age of the cavemen, who presented some similarity to the Eskimo, but with lower foreheads, with high bosses like the Neanderthal skull, and big canine teeth, like the Naulette jaw. Professor Owen, in commenting upon these statements, observes that the human jaws of this supposed period which he has examined give no evidence of a canine tooth of a size indicative of one in the upper jaw necessitating such vacancy in the lower series of teeth, as the apes present. He refers to the skulls he himself obtained from the cavern at Bruniquel, and now in the Museum of Natural History, which show neither lower foreheads nor higher bosses than do the existing races of mankind, and he makes an observation which, coming from such an expert, is of great weight—that, so far as his experience has reached, there is no skull displaying the characters of a quadrumanous species, as that series descends from the gorilla and chimpanzee to the baboon, which exhibits differences, osteal or dental, on which specific and generic distinctions are founded, so great, so marked as are to be seen in the comparison of the highest ape with the lowest man. Clearly the missing link has not as yet been discovered, and many more undoubted specimens of river-drift and cave-men must be collated before any positive statements can be made.—*Lancet.*

ANTISEPTIC TREATMENT.

MR. H. ROGERS-TILLSTONE, M.B., writing to the *Lancet* on Antiseptic Treatment, remarks:—Though not attached to the Infirmary I had frequent opportunities during the past year of visiting the Wigan Institution; seeing many things, saying few, I came to the conclusion that Listerism, or the Antiseptic Treatment, are terms not fully understood there. An operation is there followed out thus antiseptically, except that—(*a*) As a rule the part to be operated on is not cleansed with antiseptics previous to operating. (*b*) The spray is not in working order to begin with, and when the steam is up the vapour plays either under the table or in the operator's face, occasionally perhaps on the wound. (*c*) The operator's hands are not invariably dipped in antiseptic fluid before operating. (*d*) The assistants may keep their hands in their pockets until required, and without cleansing them may handle the wound or the instrument, and feel the patient's pulse between whiles. (*e*) Anyone of the staff (general practitioners in the town) requires no cleansing, because his breath is antiseptic when the spray does not play on the wound, and his hands are invariably considered pure and aseptic. (*f*) The instruments are not carefully cleansed in antiseptic fluid before use. A pair of forceps used to pick up an artery is put down anywhere, and then used to secure another uncleansed. (*g*) The spray, exhausted before the operation is over, is not used when changing the dressings. (*h*) If the operation is not very successful they blame their method. I blame their method—not Lister's.

FACIAL NEURALGIA.

EXCISION OF MECKEL'S GANGLION AND THE SUPERIOR MAXILLARY NERVE.

LAST week at the General Hospital, Birmingham, Mr. T. F. Chavasse excised the superior maxillary nerve at its exit from the foramen rotundum to its facial termination, Meckel's ganglion being removed. The spheno-palatine fossa was reached by trephining the anterior and posterior walls of the antrum, and tracing back the infraorbital nerve. The operation was performed for obstinate neuralgia of fourteen years' standing, in a man aged fifty. The wound has virtually healed, and there has been no recurrence of the pain. This operation has been previously performed by James R. Wood and Carnoghan of New York, and, we believe, a very similar one was once performed in this country. We understand that Mr. Chavasse's case of excision of Meckel's ganglion and the superior maxillary nerve, is the first operation of the kind performed in the British Isles. In February, 1880, Mr. Walsham stretched the infraorbital nerve, the patient being a woman, aged 50, subject to intractable neuralgia—a case, in fact, precisely similar to Mr. Chavasse's; it is recorded in an original article, by the operator himself, in the JOURNAL, vol. ii., 1880, page 1,009. We are informed that this patient has never suffered from any recurrence of the neuralgic pain since the stretching of the infraorbital nerve; and, also, that before the operation, removal of the spheno-palatine ganglion was proposed. The patient, however, expressly stipulated that she would not consent to any operation being performed, unless first assured that it did not entail the slightest risk to life. Mr. Walsham, moreover, was not strongly in favour of removal of the ganglion; and, it must be borne in mind, that he concludes the article above referred to, by observing that a morbid condition of the spheno-maxillary ganglion had, at that period, already been suggested as a cause of intractable facial neuralgia; and the ganglion had already been removed several times. It is, however, not improbable, the author added, that as the superior maxillary nerve must be stretched in the operation, the benefit obtained might be traced to the stretching of the nerve rather than to the removal of the ganglion. The fact that both stretching and excision of portions of the second division of the fifth pair of cerebral nerves have been performed more than once shows, at least, that facial neuralgia may resist all palliative treatment, that sufferers from this intractable disease may urgently desire operative interference, and that competent authorities and operators are not quite decided as to the superior merits of one out of two measures. No satisfactory decision will be obtained until many more such operations are performed, with the most scrupulous comparisons of results, as gleaned from histories of the course of the cases for years after the operations. —*British Medical Journal.*

DEATH FROM SWALLOWING ARTIFICIAL TEETH.

Some months ago, Mr. Francis Binnie, grocer and spirit merchant, Innerleithen, while out angling on the Tweed, lay down to rest himself and fell asleep. He suddenly awoke and found that he had partially swallowed five teeth and the gold plate that held them to the upper part of his mouth. He ran to Dr. Cameron, who, finding it impossible to pull them up the throat, pushed them down and relieved Mr. Binnie from being suffocated. Next day he went to the Royal Infirmary, Edinburgh, where the best skill attended to the case for several weeks, and he returned to his home. The plate and teeth remained in the body however, and he gradually sank until death intervened about a month afterwards, inflammation of the throat being the proximate cause of death.

MICRO-ORGANISMS OF WHOOPING-COUGH.

At a meeting of the Medical Society of London on the 16th ult., Mr. Dolan, Halifax, read an abstract of his essay on Whooping-Cough, to which had been awarded the Fothergillian medal of the Society. The disease bore much resemblance to those diseases the causes of which are now believed to be minute organisms or fungi. Its highly contagious nature, period of incubation, effervescence and deffervescence, its regular course, and the immunity from subsequent attacks, were grounds of analogy determining the place of pertussis in the group of diseases caused by protophytic fungi. In 1867 Poulet found bacteria in the sputa of pertussoid patients, and Letzerich had induced whooping-cough in rabbits by inoculating the trachea with sputa from the human subject. Mr. Dolan had repeated these experiments, and found that whilst inoculation with the blood of whooping-cough patients was without effect, that of sputa and other secretions caused death. He had found also on microscopic examination of sputa ordinary bacteriod forms, and a microbe resembling the spirochæte plicatis of Cohn. The application of special methods of staining, as employed in the detection of the bacillus tuberculosis, would no doubt reveal the special microbe of pertussis. Admitting the fungoid nature of pertussis, its contagious property was easily explained by germs being thrown off into the air and received into the body, setting up constitutional disturbance, and subsequently attacking the pulmonary epithelium, giving rise to all the phenomena of pertussis. No pathognomonic lesions could be detected on post-mortem examination, for the simple reason that whooping-cough was rarely fatal; death resulted from complications which were very numerous. Although the course of the disease could not be controlled by treatment, yet the patient could be placed in the most favourable circumstances towards recovery; certain painful and prominent sources of trouble could be relieved and complications guarded against so as to assist nature in her efforts to throw off the disease. There was no panacea or specific remedy, but if the dependence of whooping-cough upon a specific virus be the true explanation of its pathogeny, the lines on which its rational treatment and prophylaxis were to be pursued became clearer and more hopeful.

EXAMINATION FOR BACTERIA.

Mr. Kenneth W. Millican, B.A. Cantab, writing to the *Lancet* upon the presence of Bacteria in the evacuations from patients suffering from diarrhœa, says:—

The method of examination for Bacteria which I have found successful is very simple. The stain used is a solution in distilled water of "navy blue," one of Tomlinson's aniline dyes. I have generally used it of a deep-blue colour, but not of any particular strength. A lump of the gelatinous matter, like half-cooked white of egg, which is found in the fœcal discharge, is well smeared over the surface of the cover-glass and allowed to dry. The cover-glass is then floated on the dye for five or ten minutes, at the end of which time it will be found well stained. It is then washed in dilute nitric acid (1 to 3) and finally in distilled water. The cover slip is then allowed to dry, which may be aided by gentle warmth from a spirit lamp, and mounted in Canada balsam. Evaporation is a better method of extracting the water previous to mounting than immersion in alcohol, for I have found the alcohol to obscure the lustre of the aniline dyes. If preferred after the washing, the cover slip may be floated on a solution of aniline brown, made from another of Tomlinson's dyes in a similar manner. These dyes are excellent in microscopic staining, and are moreover cheap, and easily made as required. The most useful appear to be magenta, navy blue, and Bismarck brown. The violet has not proved so successful in my hands. The bacteria so observed consisted of small refractive granules (micrococci ?); short, fine rods (bacilli); long, fine-pointed rods; and curled, twisted ones. There were also mycelium-rods, frequently stretching right across the slide. All these were well seen with $\frac{1}{6}$ in. object-glass, and even with $\frac{1}{4}$ in. It is of course to be noted that the evacuations should be obtained as fresh as possible for examination. I directed terebine to be at once placed in those that were put aside for me, and they were then well covered up.

ON STAINING BACILLI.

Dr. Heneage Gibbes, Curator of the Anatomical Museum, King's College, read a Paper in the Section of Pathology at the Annual Meeting of the British Medical Association, in Worcester, August 1882, on "A New Method for the Detection of the Tubercle Bacillus." This was published in the *British Medical Journal* as follows :—

The following will be found an easy and simple method of demonstrating the tubercle bacillus. It takes a short time to carry out, and the bacillus is stained so deeply, and is differentiated so fully from the surrounding substance, that it can be seen with the greatest ease with an ordinary quarter-inch object-glass and daylight.

The methods hitherto published have often failed, and, when successful, have only stained the bacillus so faintly that high power or artificial illumination is required to show it in anything like a satisfactory manner. Koch's original method has utterly failed in the many cases in which I have tried it. I think, then, that the ease and simplicity of my method will make it acceptable to the large number of the Profession who may wish to find the bacillus tuberculosus for diagnostic purposes, whatever its value may ultimately prove to be for that purpose.

It is necessary to make two staining fluids—one, magenta, which stains the bacillus; the other, chrysaniline (?), which stains the surrounding substance, but not the bacillus. The magenta solution is made thus:

Magenta crystals	grammes	2
Pure aniline	c.c.	3
Alcohol, sp. gr. .830	c.c.	20
Aq. dest.	c.c.	20

Dissolve the analine in the spirit; rub up the magenta in a glass mortar to a fine powder; add the spirit gradually while stirring until all the colour is dissolved; then add the water slowly, still stirring, and put in a stoppered bottle.

The chrysaniline solution is made by rubbing up the colour in a mortar with distilled water until it is saturated, and then adding a crystal of thymol dissolved in a little absolute alcohol, to make it keep. Neither of these solutions should be filtered when made. The chrysoidin (?) should be kept in a dark place. A dilute solution of nitric acid is also required, which is made by diluting one part of commercial nitric acid with two parts of distilled water. The aniline colours are made by the Badesche Aniline Fabrik, 22, Bush Lane, Cannon Street.

The object of the process is to stain the sputum, or section, as the case may be, with a colour which the dilute nitric acid will remove from everything but the tubercle bacillus, and the subsequent staining with chrysoidin is only required to throw up the stained bacillus and make it more prominent. In Dr. Ehrlich's process, the stain for the bacillus is too faint, and the vesuvin, used to stain the ground substance, too opaque; consequently, the bacillus appears a faint pink colour on a dense yellowish brown ground, and is not easily made out without high power or special illumination. His method of dissolving the aniline in water, in which it is very sparingly soluble, is also open to objection, as it is very apt to vary in the amount taken up by the water.

The manner in which the stains are used is as follows. A little sputum is spread on a cover-glass and allowed to dry; it is then passed three or four times through the flame of a small Bunsen burner, and left to cool. A few drops of the magenta solution are filtered into a watch-glass, and the cover-glass, with the sputum downwards, placed on it, care being taken that no air-bubbles are under the cover-glass; it is allowed to remain from fifteen to twenty minutes. It is then put into the dilute nitric acid until all colour has been removed, which will take a few minutes; but it may be left for ten minutes without damage. It is then washed in distilled water until all the acid is removed, and placed in a few drops of chrysoidin solution which have been filtered into the bottom of a watch-glass; a few minutes will suffice to stain it deeply. It must then be again washed in distilled water, and the superfluous water drained off on filter-paper; it is then placed in absolute alcohol, to remove the remainder of the water, and dried thoroughly in the air. When dry, a drop of Canada balsam solution is placed on the cover glass, and it is mounted in the usual manner.

Glass Funnels should be used to protect the fingers in filtering the stains. Sections of hardened tissues are treated in the same manner, with the necessary modifications, and the bacillus is shown by this method equally well in specimens hardened in spirit or chromic acid.

Since my demonstration of a new method of staining the tubercle bacillus at the Annual Meeting of the British Medical Association, at Worcester, I have made some more observations, and the result of these may be interesting. From the number of letters I have received on this subject, it is evidently attracting much attention at the present time, and a few more hints may be useful. I have only received two or three letters recording failures, and these can, I think, be traced to the use of stains made up by chemists who did not know the particular aniline colour required. Messrs. Becker and Co., 34, Maiden Lane, Covent Garden, make up both magenta and chrysoidin solutions from aniline colours manufactured by the Badesche Aniline Fabrik, and their solutions may be thoroughly depended on.

Another cause of failure is the use of ordinary, instead of distilled, water, by which chlorine is evolved and all colour removed from the bacilli.

In some cases, where a patient is seen, and it is desirable to test the sputum at once, a small quantity only can be obtained, and this with evident effort; in these cases, no bacilli will often be found. The secretion coughed up comes from the back of the throat. A case of this kind puzzled me for some time. I had previously found a large number of bacilli, but on two occasions could find none. I gave the patient a wide-mouthed bottle, and told her to use it the first thing in the morning. She brought it to me next day filled with thick sputum, which was literally crammed with bacilli.

There are one or two points about this method which I should like to mention. In the first place, the magenta solution used is a definite chemical compound, having a distinct formula; it is, in fact, a diphenolrosanilin resulting from the addition of a fixed proportion of pure analin to a certain form of rosanlin, or, as it is commonly called, magenta. In Ehrlich's method, a definite compound is not formed, hence the fading of the colour from the bacilli, which does not take place when a stable compound is used. In his process, also, the protoplasm alone is stained, and with high powers rows of bead-like bodies only are seen. With the method I have given, the whole organism is stained, and appears as it really is, a rod-shaped bacillus containing deeply stained spherical bodies (? spores). In staining the ground substance, and thus throwing up the bacilli, either canelle or chrysoidin may be used in watery solution, and these are preferable for sputum, especially when it is to be examined with the highest powers. These colours are, however, not so well adapted for sections of tissue, where the cells colour so deeply with the brown stain as to make the bacilli difficult to discern with a dry ¼ of an inch. This ought to be easily done by ordinary daylight to make the process available for every-day clinical work.

I have made a number of experiments with a view of finding a good contrast to the magenta, and one which would not, at the same time, stain the surrounding tissues too deeply. I find a solution of methylene blue the best for this purpose. Make a saturated solution of the blue in spirit, then add this to distilled water until a tolerably deep blue colour is obtained. The sections are soaked in this until they have taken up a distinctly blue colour to the naked eye. They are then carefully washed in distilled water, and afterwards in methylated spirit. Care must be exercised in putting them into the spirit to keep them flat. After they have remained in the spirit for some little time, they are removed to absolute alcohol, and then oil of cloves, and mounted in Canada balsam; they are, of course, first stained in magenta, and passed through dilute nitric acid.

I have obtained some splendid results with this method, and the bacilli can be easily made out by their colour, if in any number, with a one-inch object-glass. If, however, there are only a few scattered singly through a caseous mass, they will require a one-sixth to make them out perfectly. Before using this blue stain, all acid must be washed out of the tissue.

Sputum may also be stained with this colour, and it gives a very pretty appearance to the pus cells, if properly done. Sputum, when dried on a cover-glass and passed through a Bunsen flame, may be kept for a long time if protected from dust and moisture. It is very interesting to see the enormous number of bacteria present in sputum, and they are easily shown by staining with gentian violet. The sputum is dried on the cover-glass, and heated in the usual way; it is then inverted on some gentian violet solution, half per cent. in water, filtered into a watch-glass. A few minutes will stain it deeply. The superfluous colour is washed off in distilled water, and the cover-glass is then placed in methylated spirit until no more colour comes away; it is then immersed in absolute alcohol and allowed to dry. A drop of Canada balsam solution is placed on it; it is then inverted and placed on the slide and pressed gently down. It is a good plan to run a ring of shellac dissolved in spirit round the edges of the cover-glass, as it can then be examined with an oil immersion lens in a very short time. Bacteria of many kinds will be found, together with micrococci in masses and chains, and sarcinæ; if the sputum has been kept some time before mounting, pencillium will also probably be found. A slide of this kind will afford subjects for many hours' study.

EHRLICH'S METHOD FOR THE DETECTION OF TUBERCLE-BACILLUS IN SPUTUM.

The following, also reported in the *British Medical Journal*, is the substance of the remarks made during a Demonstration in the Section of Pathology at the Annual Meeting of the British Medical Association, at Worcester, August 1882, By G. A. HERON, M.D., Assistant Physician to the City of London Hospital for Diseases of the Chest, etc.:—

The process known as Ehrlich's method for the detection of tubercle-bacillus in sputum may briefly be described in the following manner.

Sputum is spread in thin layers upon cover-glasses and allowed to dry in the air. It is next exposed to a considerable degree of heat, either by being shut up in a properly constructed hot-box for twenty minutes or so, at a temperature of 212° Fahr., or—and this answers the purpose quite as well—the cover-glasses with the dried sputum upon them, are passed three or four times quickly through the flame of a gas jet or of a spirit lamp. In this way the sputum is thoroughly set. The next step is to stain the sputum with any one of certain of the aniline series of dyes. Fuschine and gentian violet are two of those which Ehrlich has used. These colours are handled in this process in precisely similar ways, and, therefore, it is necessary to describe the use of only one of them. Fuschine was the colour which I used in my demonstration at Worcester, and I will speak of it now. A saturated alcoholic solution of that dye is made. This is added, in certain proportions, to a saturated watery solution of aniline prepared in this way:—Five cubic centimètres of aniline are added to one hundred cubic centimètres of distilled water. The mixture is allowed to stand for about twenty minutes, and, during that time, it should be frequently shaken. The aniline water is then passed through a moistened filter, and the filtrate should be as clear as good drinking water. It contains from three to four per cent. of aniline. To thirty cubic centimètres of this clear filtrate are added thirty drops of the saturated alcoholic solution of fuschine. A glistening metallic film will probably now appear upon the surface of the mixture, but should that not happen, then more of the solution of fuschine must be added until the film is clearly marked, for its presence is the sign that the staining mixture is of the proper strength. Beginners are likely to find some difficulty at this point, for the film is, in their early experiments, apt to be wanting. That being so, it may be as well to mention here, that if after sixty drops of the fuschine solution have been added to the aniline water without a distinct film having appeared, the desired result can be obtained with certainty by allowing the mixture to evaporate in the air for some hours.

And now, as to the use of this colouring fluid. The cover-glasses, with the layers of sputum upon them prepared in the way already described, are allowed to float for thirty minutes, sputum downwards, upon the surface of a sufficient quantity of the staining fluid poured into a suitable vessel. When removed from the fluid at the end of that time, the sputum will be seen to be stained with a deep red colour. The next step in the process is to remove by far the greater part of this deep red colour. That is done by washing the cover-glasses, with the sputum upon them, in a mixture of one part of the acidum nitricum (not acidum nitricum dilutum) of the *British Pharmacopœia*, and two parts of distilled water. Here again the beginner may find some difficulty, for he is apt to leave too much of the red dye upon the sputum. The consequence of that is, that when he comes to examine his work under the microscope, he finds large red-pink smudges through which he can see little, if anything, distinctly. After the washing with nitric acid there should be, at most, a slight white-pink tinge visible to the naked eye in the sputum. The acid is washed out by dipping the cover-glass in distilled water. If the specimen were now examined microscopically, and if bacilli of tubercle were present in it, they would be seen, here and there, as red rods, and perhaps in clusters also, upon a colourless or whitish-pink ground. When the bacilli are numerous they could be well seen, even with so faulty a background of colour as this, but when they are few they might easily escape notice, unless their red colour were thrown into relief, as it were, by the use of some contrast colour. With this object, the process of staining is completed by allowing a drop or two of a saturated watery solution of methyline blue to fall upon the sputum after the nitric acid has been washed out with water. The blue colour is washed off to a certain extent with water, just enough of it being left to give a distinct light blue tint to the sputum. The specimen should be examined, while still wet, with the microscope. If tubercle-bacilli are present, they will be seen as red rods upon a blue ground. All the constituent parts of the sputum and all other known bacteria take the blue coloration; the tubercle-bacillus alone retains the red colour due to the staining with the fuschine and aniline dye.

In the specimens which I prepared in this way before the Section of Pathology at Worcester, the bacilli were seen in large numbers. That is not usual. In examining a specimen of sputum for these organisms, one may reasonably expect to see one or two of them in a microscopic field, if they be present in ordinary numbers. When they are present in large numbers a cheesy-like portion of the sputum should be searched for and examined.

The tubercle-bacillus measures in length from $\frac{1}{7140}$ in. to $\frac{1}{11600}$ in. These measurements have been made on several occasions by Mr. E. M. Nelson, for whose kind help I am much indebted. Under a sufficiently high power, the blue-coloured ground of the specimen is resolved into swarming masses of blue-coloured bacteria if the sputum be not fresh. They average in length $\frac{1}{30930}$ in.

The tubercle-bacillus, so far as my experience goes, is not at all interfered with by the early effects of the putrefactive process. I have often found this bacillus present, in large numbers, in a specimen of sputum which, when fresh, seemed to swarm with these organisms. At intervals, during the last six weeks, I have examined this same specimen, which has been allowed to putrefy while freely exposed to the air. Certainly, in this particular specimen, the organism has not diminished in numbers during the first six weeks of putrefaction.

I have heard it stated in public, that very high powers are necessary for the microscopic examination of the tubercle-bacillus when Ehrlich's method has been followed. This is certainly a mistake, for I have often myself seen the organism, and shown it to other people, under so low a power as 150 diam. My friend, Mr. Nelson, tells me that he has seen the tubercle-bacillus under a power of 100 diam. I should not, however, advise a beginner to use such low powers as these. A power of 500 diam. is sufficient for the purpose of easily verifying the presence of this organism.

A condenser of some sort is a useful addition to the microscope in this line of observation, but it is not a necessity, except, of course, when a detailed examination is made. The tubercle-bacillus can be well seen by throwing a strong light directly into the line of vision. With good light, an ordinary mirror will of itself give ample illumination. The necessary colours have been supplied to me by Messrs. Morson and Son, of Southampton Row, W.C.

In speaking of these dyes I ought to have said, that I find it unnecessary to go often through the process of preparing the colouring mixtures. The fuschine and aniline dye and the methyline blue colour were nearly two months' old when I used them at the Worcester meeting. As has been mentioned above, gentian violet may be used instead of fuschine. The contrast colour would, in that case, be given by Bismarck brown. Methyline blue would, of course, make a poor contrast to the violet-coloured bacilli.

These aniline dyes are apt to fade very quickly. They may illustrate markedly the presence of the tubercle-bacillus at the first examination of a prepared specimen, and within twelve hours there may not be one of the organisms visible. I have, however, several specimens which have preserved their colours fairly well for rather over two months.

Ehrlich's process, properly used, in the way now indicated, will demonstrate the presence of the bacillus of tubercle in sections of tissue just as clearly as in sputum.

DOUBLE-STAINING OF NUCLEATED BLOOD CORPUSCLES.

Dr. Allen Y. Moore gives, in *The Microscope*, a valuable explanation of the method of differential staining by which his fine slides of blood corpuscles are produced. The blood is spread upon the slide by the usual method, drawing a drop across one slide by means of the edge of another slide. When the film of corpuscles, thus evenly spread, is thoroughly dry, the slide is flooded for three (3) minutes with a solution of rosin five grains, in distilled water and alcohol, four drachms each. The slide is then washed by passing it gently through clean water, and before drying is flooded for two (2) minutes with a solution of methyl aniline green five grains, in distilled water one ounce. It is then washed again, as before, and set aside to dry, and finally mounted in Canada balsam warmed just sufficiently to spread properly. Corpuscles prepared in this way will be found to be stained red, while the nuclei and leucocytes will be a bluish-green, and will show with great sharpness and brilliancy under the microscope.

PSYCHOLOGICAL DEVELOPMENT.

Von W. Preyer has recently published a book on the "Psychological Development in Children," in which he states that light is perceived within five minutes after birth, and that the pupils react within the first hour. On the second day the eyes are closed upon the approach of a flame. Definite proof of colour discrimination was first obtained in the 85th week, but may, of course, have been present earlier. All children for some time after birth are completely deaf, and it was not till the middle of the 4th day that Prof. Preyer obtained any evidence of hearing in his child. This child first turned his head in the direction of a sound in the 11th week. Concerning touch, taste, and smell, it appears that at birth the sense of taste is best developed, and that the infant then recognises the difference between sweet, salt, sour, and bitter. Fear was shown in the 14th week; the child had an instinctive dread of thunder, and, later on, of cats and dogs, of falling from a height, etc. Voluntary movements are preceded, not only by reflex, but also by "impulsive movements"; the ceaseless activity of young infants being due to purposeless discharges of nervous energy. Reflex movements are followed by instinctive, and these by voluntary. Up to the 17th month there is great uncertainty in finding the mouth with anything held in the hand—a spoon, for instance, striking the cheeks, chin, or nose, instead of at once going between the lips. This forms a striking contrast to the case of young chickens which are able to peck grains, etc., soon after they are hatched. Sucking is not a pure reflex, because a satisfied child will not suck when its lips are properly stimulated, and further, the action may be originated centrally, as in a sleeping suckling. Shaking the head as a sign of negation was found by Preyer, as by other observers, to be instinctive, and he adopts Darwin's explanation of the fact, viz., that the satisfied suckling in refusing the breast must needs move its head from side to side.

EXAMINATION QUESTIONS.

FACULTY OF PHYSICIANS AND SURGEONS OF GLASGOW.

At the recent examination for the Dental Diploma the following questions were given:—

SECT. I.—ANATOMY.

1. Distinguish between the lower jaw of a child, an adult, and an old man.

2. Give the course and distribution of the third cranial or oculomotor nerve.

SECT. II.—CHEMISTRY AND PHYSIOLOGY.

1. How many elementary bodies exist in the air and in what condition?

2. Give two methods by which chlorides may be prepared, and give the tests for chlorine and chlorides.

3. Mention what purposes are served by water in the animal economy.

SECT. I.—SURGERY.

1. Describe the operation for plugging the posterior nares in cases of hæmorrhage.

2. Give the symptoms and treatment of a fracture of the base of the skull, involving the petrous portion of the temporal bone.

SECT. II.—MEDICINE AND MATERIA MEDICA.

1. Describe the remote effects of dental disease.

2. Give the therapeutic action of rhubarb, castor oil, and sulphate of magnesia. State the doses of each.

3. Describe the characters, action, and uses of nitric acid, nitrate of silver, and chloride of lime, respectively.

SECT. III.—DENTAL ANATOMY AND PHYSIOLOGY.

1. Describe minutely the anatomical features of the crown and roots of a first upper molar.

2. Tabulate the deciduous teeth, upper and lower, giving individually their period of eruption.

3. State what you know as to the stratum Malpighi, and what part it plays in the development of a tooth.

SECT. IV.—DENTAL SURGERY AND PATHOLOGY.

1. What conditions may give rise to ulceration of the gums, and what treatment would you adopt?

2. Describe the formation of an alveolar abscess and the operations that may be performed to afford relief.

3. What forms of malignant disease are more commonly met with in the mouth, and how are they to be recognised?

ROYAL COLLEGE OF SURGEONS OF ENGLAND.

Examination for Diploma in Dental Surgery, October 23, 1882.

ANATOMY AND PHYSIOLOGY.

1. Describe the mechanism of the joint of the lower jaw, and enumerate the muscles by which each of its movements is effected.

2. Describe the changes which take place in the heart during a single beat and pause of the pulse, and the sounds by which these changes are accompanied, indicating the causes of the latter.

SURGERY AND PATHOLOGY.

1. What is meant by an "Epulis"? What is the usual structure of such a tumour, and what treatment is appropriate for it on its original appearance, and on its recurrence?

2. What means have been devised for the treatment of the more complicated cases of fracture of the jaw, and under what circumstances is each of these advisible?

DENTAL ANATOMY AND PHYSIOLOGY.

1. What teeth are used as sources of ivory? Mention any peculiarities in the ivory derived from the several animals, especially in that which has been employed for Dental purposes.

2. Write a short description of the development, minute anatomy, and chemical composition of human dentine. How is its sensitiveness explained?

3. Describe specimens 1 and 2 under the microscope.

DENTAL SURGERY AND PATHOLOGY.

1. Name and briefly describe the tumours which have a Dental origin.

2. Mention some of the diseases and constitutional conditions which most markedly affect the teeth. What lesions do they respectively cause?

3. What are the peculiarities of palladium, of Fletcher's and of Sulivan's Amalgams, and of gold and tin foils used in combination? What differences in manipulation do the first three respectively require?

PASS LISTS.

ROYAL COLLEGE OF SURGEONS OF EDINBURGH.

The following gentlemen, having passed the required examination, received the Diploma in Dental Surgery at a meeting of the Board of Examiners on Wednesday last:—

Ackland, John M'K., Exeter.	London Dental Hospital.
Albert, Henry Louis, Sloane Street.	
Andrew, John James, Belfast.	
Cornelius, William Fryer, Teignmouth.	
Edwards, Richard, Pontdolgoch.	
Gould, John Horace, Exeter.	
Kissack, Frank Hill, Douglas, Isle of Man.	
Royston, Jonathan, Douglas, Isle of Man.	
Tester, Alfred Horace, Brighton.	
Bate, Frederick William, Alexander Road.	National Dental Hospital.
Hughes, Morgan, Redhill.	
Patterson, William Todd, Kingsland.	

One candidate was referred.

FACULTY OF PHYSICIANS AND SURGEONS, GLASGOW.

At the recent Dental Examination by this Faculty,

Arthur Petch Penrose, L.D.S.I.,

passed the necessary examinations.

There was only one candidate.

NEW INVENTIONS.

ELECTRIC MOTOR FOR DENTAL ENGINE.

THE application of Electricity as a source of motion to Dental appliances is becoming more extensive. Perhaps the most recent novelty in this way which is now offered to the public, is the attachment of the flexible arm of a Dental Engine to the spindle of an Electric Motor. Great speed and ample power are obtained from the Motor, and the great convenience and facilities of the apparatus can be readily seen on referring to the illustration on page 1 of the Advertisement Sheet.

ADJUSTABLE BRACKET FOR THE MORRISON CHAIR.

THIS will be found a convenient arrangement of Table, Spittoon, and Tumbler Holder. The bracket is clamped to the leg of the Chair, and the several parts may be adjusted to any height.

AUTOMATIC GAS STOP VALVE.

THIS is a Clock Adjustment for shutting off the gas supply to the Vulcanizer at any time at which the clock may have been set. It is something like an alarm adaptation. By means of the Gas Regulating Pressure Gauge, which does not permit the temperature to rise above a given degree, and by this new Clock Stop Valve the working of a Vulcanizer is rendered perfectly automatic. The gas may be lighted, the instruments set, and the apparatus left without further attention. An illustration is given on page 2 of the Advertisement Sheet.

GLASS-CLOTH DISCS.

THE Dental Manufacturing Company have just brought out some very flexible Engine Discs made of Glass-Cloth. They are of different sizes, and their cutting power is surprising.

CORRESPONDENCE.

We do not hold ourselves responsible for the views expressed by Correspondents.

THE NEW MODE OF APPLYING VACUUM CHAMBERS.

To the Editor of the DENTAL RECORD.

SIR,—Having just had my attention drawn to a notice in your Journal of this month (October) respecting an invention of a covering for the vacuum in vulcanite dentures. I wish to make a passing remark without desiring to claim any priority, that I have already (but not with zinc) worked out such an idea, and tried a number of cases, but have now abandoned the use as being of no utility in the retention of upper dentures, especially with the present make of gauze as sold at the depôts. The kind required for that purpose is a stouter wire and more open pattern of check for the grid. Hoping you will oblige by inserting the above,

I remain, yours respectfully, W. C. R.

Editorial.

Though the Winter Session in English Medical affairs ordinarily commences with October, yet it is not until November that the Scottish Schools reassemble and the several Societies resume their meetings. It is, therefore, not until this present month that the Professional work of the Winter Session fully begins, or is in full swing.

The Societies of the Dental Profession have their special functions to accomplish; and their proceedings, as reported in the periodical Dental literature, or published in the official *Transactions*, are to be regarded as very important indications of the progress of the Specialty. The increments of knowledge have recently been rapid, numerous, and great; and it may truthfully be said that the foremost ranks of the Dental Profession are fairly abreast with the great body Medical, in the onward march of Science. This position has to be maintained; and our Societies will have to bear the criticism of professional opinion upon the part they play in future advancement. "In former days," as Prof. Huxley recently remarked, "men were content with being learned, but now we must not only know what is known, but help to extend the bounds of knowledge."

Whilst this duty is being performed by those bodies of whom much may be expected, it is no less incumbent upon each individual practitioner to lend his aid to progress, if not in investigation, at all events in embracing the benefits that may accrue to himself, his patients, and his Profession, from each sound theory advanced, new fact ascertained, or improvement made.

It is the passive resistance of Standstill, having, along with apathy and petty jealousy, the parentage of ignorance, that has to be overcome in moving onwards the great mass of the Profession. It is upon the general aspect presented that public opinion judges; while the criticism of inner actions, as of our Schools and Societies, is more limited and special, indeed personal.

GOSSIP.

In his address at the Southampton meeting of the British Association in August last, Prof. H. N. Moseley, F.R.S., said, regarding pelagic life, that the existence of pelagic animals at all is directly dependent on that of pelagic plants. No animal life can exist without vegetable food as a basis, and the first living substance which came into existence must have been capable of constructing protein for itself from inorganic sources, and been physiologically a plant. Now, in many regions the sea-surface teems with vegetable life. In the Polar waters diatoms swarm, sometimes occurring so abundantly that they render the water thick like soup, and being washed up on the ice in the Antarctic regions, colour it brown, as Sir Joseph Hooker showed. When a fine net is towed overboard amongst them, they fill it with a jelly-like mass that, when squeezed in the hand, leaves behind their skeletons, a mass of fine silica like cotton wool. In the temperate and warmer seas, diatoms, though still present, are scarcer, and their place is taken by other simple minute algæ, mainly oscillatoriæ. As we passed through the Arafura Sea between Australia and New Guinea in the *Challenger* Expedition, the whole sea for several days' voyage was discoloured far and wide by such algæ, and smelt like a reedy pond; and in the Atlantic we passed for days through water full of minute algæ (*Trichodemium*) gleaming in the water like particles of mica. From these fine algæ the simpler animals, on which the higher animal forms subsist, derive their food.

In a paper on "Infantile Mortality, some of its Preventable Causes," read at the Sanitary Congress by Mr. A. E. Harris, Medical Officer of Health for Sunderland, he said, as regarded food, the great curse of infantile life was the ardent desire of parents and nurses to behold their infants taking solid food. They waited with considerable patience for a few weeks to pass, until at last they gave the infant bread, biscuits, or some specially prepared food, all of which might be very appropriate for a child which had cut some teeth, but which, given in its early days, was frequently the formation of debility and death.

Mr. Agassiz is convinced that the surface fauna of the sea is really limited to a comparatively narrow belt in depth, and that there is no intermediate belt so to speak of animal life between those animals living on the bottom or close to it and the surface pelagic fauna. If this be the case, it is argued that the limit in depth from the surface must be ultimately due to the limit in the penetration of sunlight, and consequent growth of vegetable organisms.

M. Brown Séquard has lately made the interesting observation (*Comptes Rendus*) that complete local anæsthesia may be obtained in the larynx by directing on the upper part of that organ (through an incision at the back of the animal's mouth), a rapid current of carbonic acid, for fifteen seconds to two or three minutes. It becomes possible to introduce a tube and even a finger (in the case of a large dog) into the cavity of the larynx, and to turn it about without producing reaction. Chloroform vapour gives the same effect, but the other gas is preferred. There is some irritation at the outset. The local anæsthesia, which is accompanied by incomplete general anæsthesia, lasts several minutes (two to eight) after stopping the current. The experiment was repeated several times, at intervals, on the same animal, and no evil results were apparent. M. Brown Séquard proposes to experiment on the human subject by introducing carbonic acid into the larynx by the mouth or nostrils.

Dr. D. P. Kayner, writing in the *Mining Review*, states that while experimenting in California upon the sands and quartz for the separation of gold, he came to the conclusion that gold was not an elementary substance. Acting upon this conclusion, he made a metal resembling gold in every respect. His *modus operandi* was as follows: "Experiment we did; and taking certain proportions of the three baser metals, combining them with such other substances as would represent as near as possible Nature's alchemy, luting the whole together in a French clay crucible and encasing that in a black-lead crucible all closely covered and luted to represent the confined state of minerals and gases in the earth. The whole was placed in a Chilton furnace and kept at its highest heat for several hours, when the contents of the crucible were poured out, resulting in a nugget of metal having all the characteristics of pure gold—viz., colour, malleability, and resistance to acids."

Dr. C. N. Pierce, Philadelphia, regulates retreating upper incisors by taking a piece of platinized gold, twenty-four gauge and about one-sixteenth of an inch wide, and making each end pointed. He then drills a small hole in the tooth to be moved and one in the first molar, and springs this piece in place. It is not in the way as it lies along the lingual surfaces of the intervening teeth. If the tooth does not remain in position a retaining plate should be made. The strip of gold should have a hole drilled near one end so that it can be tied in to prevent its being swallowed. The small pits can be filled after the teeth are regulated.

PROF. E. RAY LANKESTER says the day is not far distant when we shall see inscribed over the door of every zoological laboratory "Let no one enter here unversed in histology." Geometry was not less indispensable for the intelligent student of Greek science than histology is rapidly becoming for the modern zoological student. The question is how to find time (except in countries where time is not money) to make the student first a histologist and then a zoologist.

AT the Annual Meeting of the Royal College of Surgeons, Edinburgh, held on the 18th ult., Prof. William Turner was elected President for the ensuing year. The following Dental Examiners were also elected: Dr. Patrick H. Watson, Mr. Francis B. Imlach, Drs. H. D. Littlejohn and John Smith, Mr. Andrew Wilson and Mr. George W. Watson.

THE Odontological Society of Great Britain will hold the opening Meeting of the Session 1882-3, at 40, Leicester Square, on Monday, November 6th, when Dr. Alfred Carpenter will read a paper entitled "A Consideration of some of the Causes which give rise to Dental Decay." Casual communications have been promised by Messrs. Charles Tomes, A. Coleman, and Henry Smith.

THE first Ordinary of the Odonto-Chirurgical Society for the present session will be held in Edinburgh, on Thursday the 9th inst., when Mr. Thomas Gaddes will read a paper on "The Limitations of Dental Surgery."

AT the recent quarterly meeting of the Council of the Royal College of Surgeons of England, Mr. Cooper Forster was elected to the Board of Examiners in Dental Surgery, in the place of Mr. Birkett.

DR. W. ST. GEORGE ELLIOTT will commence at 7.30 p.m., on Wednesday, the 1st inst., a course of Lectures on Operative Dental Surgery, at the National Dental College, Gt. Portland Street.

THE Annual Dinner of the past and present students and friends of the National Dental Hospital and College will be held at the Guild Hall Tavern, City, on Wednesday, the 22nd inst.

THE *Missouri Dental Journal* says the DENTAL RECORD is "The handsomest English Dental Journal extant."

Communications.

Communications have been received from E. J. Ladmore, Leeds; W. R. Humby, London; W. C. R.; House Surgeon of National Dental and London Dental Hospitals; &c.

Books, &c., Received.

"The Elements of Dental Materia Medica" (third edition), Stocken; "British Journal of Dental Science;" "Journal of British Dental Association;" "Dental Cosmos;" "Dental Advertiser;" "Dental Register;" "Chemist and Druggist;" "Sanitary Record;" "Items of Interest;" "Missouri Dental Journal;" "Ohio State Dental Journal;" "American Journal of Dental Science;" "Revue Odontologique;" "Progrès Dentaire;" "L'Odontologie;" "Circulaire Annuelle de l'École et de l'Hopital Dentaires Libres;" "Zahntechnische Reform."

THE

DENTAL RECORD.

VOL. II. DECEMBER 1, 1882. No. 12.

COPPER AMALGAM.

By W. R. HUMBY, L.D.S.Eng.,

Demonstrator of Dental Mechanics, and Assistant Dental Surgeon to the National Dental Hospital.

IN the following Paper I shall confine my remarks to a simple account of some of the characters of the above as a filling for the teeth, after an extended experience in its use in the mouth, and not attempt to explain the reasons for the phenomena present, but simply to chronicle them.

To begin by giving a list of the necessary features which should characterise an ideal stopping I should deem waste of time, as every tyro must be aware of such. The ideal is always elevated by mankind beyond its own reach, thus providing a goal towards which we should strive. Admitting our inability to attain it, we yet derive the greatest possible benefit in the attempt.

Some years ago I occasionally saw in the teeth of patients who came under my notice a filling which seemed to my mind a perfect material for the purpose in every respect, excepting colour; and on one occasion I removed a lower molar (which had become very loose) containing a filling said to have been inserted by a Dublin Dentist thirty years previously. As a perfect specimen of what is required as a filling, with the exception of its colour, no more beautiful example ever came under my notice. Although intensely black on the surface, the stopping so perfectly filled the cavity that no staining had been imparted to the tooth substance, the latter remaining as translucent and creamy in colour as it was on the day of the insertion of the filling. The position of the cavity was on the buccal surface, and must have been originally resting on the gum margin; but, owing to subsequent absorption of the sockets and retrocession of the soft parts, the cavity was not near the gum when I saw the case. The surface was still flush with the enamel, and, with the exception of colour, it formed a filling realising all the conditions we required.

Now, the very close resemblance which this filling bore to Copper Amalgam shortly after insertion into the teeth induced me to regard the latter as identical with my Irish specimen, and for some years I laboured on in this same sweet belief, encountering from time to time many failures; but these I regarded as the result of some fault of my own inattention to cervical and gum margins, etc. It was not until a most accomplished plugger asked me (when we were speaking of the filling-in question) whether I ever found the amalgam fail at the gum margin, whether interstitial or otherwise? No one, I was sure, who knew anything of the gentleman of whom I speak, would for one moment suppose that negligence or want of manipulative skill had anything to do with his failures; I am sure that every chance which could be given to a stopping would be to the minutest detail given by him.

It so perfectly accorded with my previous humiliating experiences that I resolved to examine every stopping of the kind in future at the points referred to. To my dismay, although apparently preserving the tooth where the filling was visible, in no single case did I find the filling or tooth free from defects at parts covered by the gum; some had spaces of considerable size in almost inaccessible positions, and this condition was so constantly the case as to leave no doubt on my mind that this bad result was due to some inherent nature in the stopping when submitted to the conditions I have mentioned. The preceding is but one of several objections to the use of Copper Alloy, although, perhaps, the most objectionable from its insidious nature; the result being brought about apparently by a rapid disintegration of the stopping, followed, of course, by subsequent caries of the exposed tissue. The next fault in the order of its importance is the slow denudation of the surface if exposed in whatever position it may happen to be. This, at first sight, appears to be due to attrition; but I do not think wear alone is sufficient to account for it, as in crown cavities which may have become very much cupped the surface is in some places bright while the other parts have a sort of black powder loosely attached to the surface. If an impression be taken of such a cavity the loosely attached particles will come away on the surface of the material in which the mould was obtained, leaving the surface of the stopping bright. In some cases I have seen a metallic film lining a cavity which, I presume, had been formerly filled completely.

This latter condition supplies, I believe, the concluding objection which I shall urge against this ancient, I cannot say venerable, deceiver. The black powder seems to become attached to the teeth in the neighbourhood of the stopped one. Let us suppose a second molar of either jaw to be the unfortunate recipient: in most cases the tooth so filled is, throughout its whole substance, changed in colour to a most loathsome black or very dark bottle green, while the surface disintegration supplies very liberally mourning garments for the first and third molars, and the funereal condition is only to be remedied by the removal of the cause of their going into black, *i.e.*, removal of the stopping.

I am induced to write this owing to my own failures and those I have witnessed from other men, together with the fact of the filling again rising in favour and its sale largely increasing. I am convinced that this latter popularity is largely due to the resemblance in appearance which it bears after a short time in the mouth to palladium amalgam, of which I now believe my Irish gem was composed.

I am tolerably sure that the seniors of the Profession would be able to endorse my statements. While to such of our Profession those objections will be well known, there are, I know, others, the experiences of whom time has yet to ripen, who can profit, if they will, by what I have endeavoured to set forth.

In the career of a Dental Surgeon there is this advantage—his education has been largely practical, consisting of knowledge acquired by men who have preceded him ; and the plainer the matters and the stricter the truths taught and received the better for the credit of the Profession and the welfare of the public. I have seen honourable, painstaking students, on the one hand, doing exquisite gold fillings, while, on the other hand, they were using Copper Alloy as a filling for other teeth in the same mouth, and in that way the good done was more than counteracted by the evil.

I personally would rather read from others than write myself, but in discussing the properties of any substance in general use in our Art we submit our opinions to the Profession for confirmation or refutation, according to their truth or otherwise.

BOOK REVIEW.

ELEMENTS OF DENTAL MATERIA MEDICA AND THERAPEUTICS WITH PHARMACOPŒIA. Third Edition. By JAMES STOCKEN, L.D.S.Eng., Pereira Prizeman for Materia Medica. Assisted by THOMAS GADDES, L.D.S.Eng. and Edin. London: J. & A. Churchill.

WE have recently had placed in our hands the third edition of Stocken's Materia Medica. We are pleased to see that this work has met with such unqualified success. Our thanks are due to any member of the Profession who brings forward a work which tends to enlarge our knowledge, and to place in our hands additional power to deal with the varied cases that pass under the treatment of the Dental practitioner, and these thanks we heartily tender to the editors. The third edition is larger than the second by some eighty pages, the chief additions being an "Index of Diseases," and several fresh medicines included in the part allotted to Special Pharmacology. With regard to the book itself, improvement has been made in the quality of the paper, type, binding, etc. Among the minor alterations we notice that the various paragraphs, especially in the first part of the book, are headed by the subjects of which they treat in much stronger, clearer type than formerly, so as to impress upon the student's mind the matter with which he is dealing. A great many sentences and paragraphs have been reconstructed with considerable advantage, and in the alphabetical arrangements the names of many substances which in previous editions had been misplaced are now referred to their relative positions. Of clerical errors the book is not entirely devoid, but is remarkably free. The authors certainly treat the subject in its widest aspects, and, considering the somewhat limited scope of Dental Surgery at the present time, we turn to the preface for their reasons for so doing. In the preface to the second edition we are told that, "anticipating the results of the noble efforts then being made (1878) to raise the intellectual status of the Dental Profession, and viewing the probability that at no distant date Dental Materia Medica might form a part of the curriculum of the Dental student, he (the editor) decided to enlarge its scope." In the preface to the third edition the authors state that " the desire to take full advantage of the considerable increments, particularly of a specially Dental character, to the sub-sciences Materia Medica and Therapeutics, have led to the necessity of a new edition rather than a re-issue." As we glance through the work we see that most of the additions to the Special Pharmacology are such as Eucalyptus Oil, Resorcin and Sanitas, substances which have truly dental uses, and we also notice that some few medicines which we presume the authors considered somewhat away from the subject have been omitted, but we are still aware of the presence of a great many general remedies, tonics, alteratives, etc., which the average Dental practitioner never has prescribed, and in all probability never will, certainly not those of this generation.

Were we like some of our transatlantic brethren, disposed to extend our practice from Dental to Oral Surgery in its widest meaning, such a work as we are now considering would be indispensable; and if, as we learn, it has made its way across the Atlantic, we have no doubt as to the welcome it will receive there from specialists pursuing that line of practice. And yet we would on no account wish to be understood to say that its contents are not invaluable to us, and we are referring now more especially to the remedies not in frequent use.

It is the case now, and will be far more so in the future, when patients find that they have Dental practitioners to deal with who are versed in the sister profession—that they will refer to us as to the value of such and such a medicine in perhaps the cure of intractable neuralgia, or ask us directly for means of relief from their pain. If we are able to treat the matter in a decided and clear manner, so much the more shall we, and the Dental Profession of which we are a part, rise in the esteem of the patient and of the general public.

Passing on to a more detailed consideration of the book we find that the large section alloted to Special Pharmacology has been very carefully re-examined, and irrespective of some 14 additional medicines a very great number of them bear the mark of the reviser's pen. In many instances paragraphs have been added in order to keep the accounts strictly up to date, and in each case where the substance is administered internally the dose is given at the termination of the article.

Aromatic sulphuric acid is mentioned, and its uses detailed with special reference to its service in the treatment of Pyorrhœa Alveolaris. It is used diluted to half strength to soften the calcareous deposit, and dissolve the carious portions of the alveolar border. Its method of application is briefly this: Small pledgets of cotton wool are saturated with the acid and placed in the "pocket," or sinus which usually exists beneath the free margin of the gum, it is left in this position for one or two hours, and then removed and the parts well syringed. Its stimulating action also favours healthy granulation. Though a method of treatment simulating the above is followed by some practitioners, we do not recollect to have seen it introduced in detail in any of the English text books, though Mr. Coleman, in his "Dental Surgery," alludes to its value in the treatment of the so-called "Rigg's disease."

On page 97 we are glad to notice that a somewhat sweeping assertion which existed in the second edition with regard to the efficacy of Aconite in the treatment of neuralgia has been modified. No one who has had any experience in the matter would hesitate to accord to this drug a very high place in the long list of remedies on record for the cure of this disease; at the same time it is no uncommon occurrence to find that a medicine which in one instance has completely relieved the patient of pain, has in another, apparently similar case, utterly failed to do so. This is perhaps more notably the case in the treatment of neuralgia than in any other disease.

In the article on Arsenious acid, the results of Dr. Arkövy's experiments as recorded in his Paper read before the recent International Medical Congress have been referred to, and some of the more important results of his investigations embodied in a paragraph. When we consider the careful way in which this gentleman conducted his experiments, we cannot but look upon it as an important addition to Mr. Stocken's book. The dose for application to an exposed pulp, which the latter recommends, is given $\frac{1}{20}$th to $\frac{1}{24}$th of a grain. Dr. Arkövy came to the conclusion that the smallest dose to be used was the $\frac{1}{70}$th of a grain, and the largest $\frac{1}{20}$th, while some American authorities advocate even smaller doses still. We are disposed to think that as a matter of practice by far the greater majority of practitioners use at least $\frac{1}{16}$th, or even $\frac{1}{10}$th, though whether it is advisable to do so is perhaps open to question, at all events we infer that such a course is not followed by any serious harm or it would not be continued. The authors also refer to Dr. Arkövy's experiments as to the action of Pepsine as another devitalizing agent. The doctor advocates its employment in all cases where rapidity is not essential, where from the size of the apical foramen, or from the situation of the carious cavity beneath the edge of the gum there is danger of injuring the surrounding tissue by the use of Arsenic. It takes longer to operate, and produces in its action upon the pulp a defined line of demarcation from the apical portion which is left untouched. It is undoubtedly a valuable remedy to have at hand for the special cases that Dr. Arkövy cites, but we should hesitate in saying that its adoption would ever prove general.

Under the head of Calx Chlorata (Chlorinated Lime) an account is given of the best methods of employing this substance for the purposes of restoring a stained darkened tooth to its normal colour. One plan advocated is to use this bleaching agent together with a solution of oxalic acid (10 grs. to 1 oz. of water). The apical foramen is first plugged. "The difficult point is to bring the acid in connection with the lime, so that while it may accomplish its work effectually there may be no loss of the chlorine. This may be accomplished by dipping the instrument in the weak solution and then in the lime, and inserting the mass rapidly into the cavity." The cavity is then sealed with gutta-percha; after the lapse of several days this may be removed and the dressing renewed if necessary. The instruments should be made of wood, ivory, or platinum, and on no account of steel. The success of the operation is not discussed here, indeed it would be out of place in a work of this kind, but even when every precaution has been taken, we think we are not far wrong in stating that the good results are rarely permanent.

The Anæsthetics have received their full amount of attention in this work. The articles treating of Ether, Ethidene Dichloride, and Ethyl Bromide have been largely added to, principally in the accounts of their Physiological effects and the manner of their administration; indeed we think great credit is due to the authors for the clear and concise manner in which they have laid before us the relative values of these and the various anæsthetic agents—their effects upon the system including the mode of death produced by an overdose, and also the signs exhibited by the patient from the time of commencing to inhale them up to the period of full narcosis.

The artificial modes of respiration which have been introduced into the article upon Nitrous Oxide, though certainly not usually treated of in works on Materia Medica, are not, we venture to think, at all out of place here. In order to illustrate more clearly the method advocated by Dr. Sylvester, two woodcuts have been introduced, one showing the position of the body whilst inducing inspiration, the other its position in expiration. Among the more recently introduced antiseptics mentioned we see Eucalyptus, Iodoform, Menthol, Resorcin, and Sanitas. The first two when used together—the Iodoform in solution of the oil—have been employed with a considerable amount of success as a dressing for "dead" teeth and in the treatment of alveolar abscess. Menthol is said to possess the property of producing local anæsthesia when applied to a part, by paralysing the terminations of the sensory nerves. From all accounts it would seem to be very serviceable as a dressing to an exposed nerve in an aching tooth, but there seems to be insufficient fact to prove it. The Dental use of Resorcin is as an antiseptic for dressing the pulp canals of "dead" teeth, the advantages claimed for it over carbolic acid are, that it is "more soluble in water, almost destitute of smell, less irritating, and its toxic action slight." Sanitas has been employed in Dentistry in much the same way as the foregoing ; it is antiseptic, disinfectant, and non-poisonous, and its flavour is generally more agreeble than either Carbolic acid or Eucalyptus.

We notice in the account of the uses of gutta-percha that it is not now spoken of as useless for taking correct impressions of the mouth. That part is erased, and in its place is substituted the method pursued by Mr. Walter Coffin, by which the disadvantages which existed in the former manner of manipulating are obviated.

Near the end of the book an Index of diseases is given. It appears certainly to be very complete and exhaustive ; from their number we are unable to do anything but notice them in passing, though perhaps a few words might be said on the subject of Neuralgia. No less than 50 medicines are recorded for its treatment, and it is needless to say that these include general tonics, nerve tonics, general and topical benumbers, etc. Any one seeking after a cure who was somewhat unversed in the various remedies and their respective natures, would certainly feel himself at some loss at which one to select. Among them we notice the name of Tonga, a drug which has been the subject of some consideration of late. Its botany is not accurately known, but, as we get it here, it consists of bundles of fibrous substance, probably a root and the inner bark of two or more plants. It was brought here in the first instance from Fiji, where it had gained among the natives a reputation for the cure of Neuralgia. An infusion is made, of which a dose is taken two or three times daily, the cure as a rule following on the second or third day. In eight or ten days the pain may return, when a few additional doses will, it is said, effect a permanent cure.

Before concluding this review we would again tender our thanks to the authors for this work which they have laid before the Dental public. It enables the student, and practitioner as well, to form an accurate idea of the substances with which they are daily dealing, their nature, properties, and history; by the latter class of readers the greater part of the book will probably only be used for reference, but as a work of reference we have no hesitation in saying that it should be found at hand on the bookshelf of every Dentist who takes a broad and enlightened view of his adopted Profession.

THE LIMITATIONS OF DENTAL SURGERY.

A Paper read before the Odonto-Chirurgical Society, Edinburgh, November 9th,

By Thomas Gaddes.

Mr. President and Gentlemen,—

The consideration of this subject, in its broad and comprehensive aspect, embraces the question—What is Dental Surgery? Every practitioner of that branch of medicine ought to be able to give an answer to that question. But, as yet, a complete definition has not been agreed upon, neither has one been formulated to meet with general approval. The question is, likewise, a difficult one to deal with, but that is no justification for avoiding it. It has also been considered an ethical question, but surely that is an erroneous application of the term.

The question of the Limitations of Dental Surgery is one that deals with the quantities of the several (medical) sciences embraced by Dental Surgery; it also deals with the relations of Dentistry as a sub-division of Medicine to other sub-divisions of that parent subject—to know these is essential to its classification as a scientific specialty. Ethics, on the other hand, is the definition of conduct—"the adjustment of acts to ends." And before we can judge of the right and the wrong of all actions bearing upon Dental Surgery, we must first know what Dental Surgery is. Having formulated the quantities and the relations of Dental Surgery—having agreed upon its limits and classification—, then, and not until then, can we have complete scientific data of Ethics whereby professional conduct may be judged. Allow me to assure you that it is not my intention to now deal with ethics, though the data of professional ethics are based upon, and are an outcome of, the recognised relations of Dental Surgery.

I shall divide the subject thus:—

1. That the subject is essentially and in every respect Scientific.
2. The connection that Dentistry has with Medicine, Surgery, and Materia Medica.
3. The scope of Dental Surgery as exemplified by—
    - *a.* The Medical Aspect of Anæsthetics, of the Treatment of Neuralgia.
    - *b.* The Surgical Aspect of Neuralgia; of the Extraction of Teeth; Removal of the Alveolar Process; the Treatment of Chronic Alveolar Abscess; Necrosis; the Division and Excision or Removal of the Gum, of Polypi (tumours) of the Gum and Dental Periosteum.
    - *c.* The Use of Therapeutic Agents, Constitutionally and Locally.
4. Are the subjects enumerated as being on the borderland of General and Special Practice to be regarded by the Profession as within the Limits of Dental Surgery?
5. Is the education required of the Licentiate in Dental Surgery sufficient to enable him to practise this branch of Medicine?

1. That the subject is essentially and in every respect Scientific.

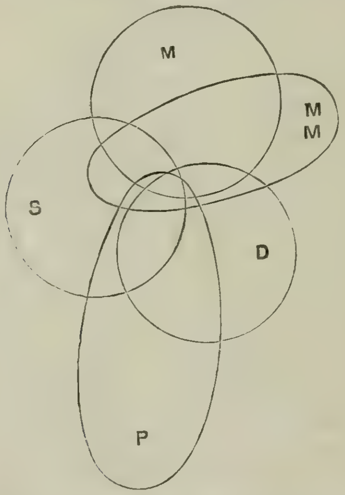
The study of the Limitations of Dental Surgery is one which deals with phenomena of a distinctly concrete kind; and these are physical and biological. The concrete sciences in their totalities cannot, as the term implies, be studied in the abstract; therefore, biological phenomena must be correlated with the physical. Physical science, as generally understood, includes the study of statics, dynamics, chemistry, heat, light, electricity, etc.; so that the Principles of Mechanical Dentistry, and also of the filling of teeth, are based upon our knowledge of physics. To the practice of the several Sciences which take cognisance of those principles is added Art, or skill, in performing or producing certain works, and thus is obtained an approximate locus and definition of those sections of Dentistry—of the Science and Art of Dental Mechanics, and the mechanical filling of teeth.

The biological phenomena which Dentistry embraces are morphology, physiology, pathology, pharmacology—indeed all that relates to our knowledge of diseases of the teeth and (shall I say?) of their contiguous structures. The study of the Relations of those several component biological modes of force is essentially scientific, there is no art about it. How much, what Quantities of the sub-sciences of medicine, surgery, and materia medica shall be embraced in the study of Dentistry as a specialty, is a question, likewise, essentially scientific—the premises of the question are terms which deal with concrete phenomena, and therefore it cannot be anything else than a scientific question; yet a much-respected member of the Profession has, by implication, stated to the contrary.* If Dentistry is to be regarded as a sub-division of the parent subject—Medicine—, a definition of its relations to other sub-divisions is also essential to its classification as a scientific specialty. At the present time such a definition is wanting; the Limitations of Dental Surgery are left to the lamentable uncertainty of tradition, the variability, fallacy, and nescience of the incoherent ideas of individual practitioners.

Dentistry, therefore, is a Science and an Art, and the study of its quantities and relations—its Limitations—a scientific study.

2. The connections of Dentistry with Medicine, Surgery, and Materia Medica.

That such connections do exist requires, I think, but little argument—they are self evident. Therefore, I shall briefly state that, considered as a science, Medicine takes cognisance of all that relates to our knowledge of diseases—of the circumstances under which they arise, their conditions of existence, the nature of their causes and their treatment. Surgery—the primary division of Medicine—has for its object the cure or relief of certain morbid conditions of the body.



The above Woodcut has been prepared to diagramatically represent the relations of the sub-sciences collateral with and including Dentistry. M, the practice of Medicine; S, Surgery; M M, Materia Medica; P, Physics; D, Dental Surgery. To illustrate the connections with Morphology, Physiology, Pathology, etc, would require several planes, and it is thought the above is sufficient for the present purpose.

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* *Transactions of Odontological Society of Great Britain*, Vol. XIV. (April, 1882), page 142.

But the line of demarcation between the ordinary practice of Medicine and of Surgery is somewhat arbitrary, conventional, and indefinite. Materia Medica is that branch of Medical Science which treats of the remedies (or medical materials) employed in the prevention and treatment of disease.

In the every-day treatment of diseases of the teeth operative (Surgical) means and the use of drugs (medical materials) are resorted to. In these respects, apart from any other considerations, is Dentistry connected with the parent science--Medicine.

3. The scope of Dental Surgery.

In endeavouring to ascertain what are the quantities of the collateral branches of Medicine that Dental Surgery includes, I shall, at the onset, quote a most highly distinguished and esteemed member of the Profession. In the last edition of Gant's Surgery,* the special chapter on Dental Surgery is written by Mr. Chas. S. Tomes, F.R.S. He writes thus:—"There is a border-land between the provinces of the General and of the Dental Surgeon, with which, both for the welfare of the patient and the credit of the practitioner, it is important that each should be familiar . . . . . The space devoted to Dental Surgery will, therefore, be most usefully devoted to this common ground." This includes Dentigerous Cysts, Odontomes, Abscess of Antrum, Diseases of Gums and Alveolar processes, Neuralgia, etc. The study, knowledge, and treatment of these diseases, which are here spoken of as being on the border-land of special practice, may also be regarded as supplying indications of the Limits of Dental Surgery.

The administration of anæsthetics is daily and very largely undertaken by Dentists. In the *Transactions of the Odontological Society of Great Britain*, Vol. XI., page 6, *et seq.*, there is recorded some experience of the personal administration of anæsthetics by Messrs. John Tomes, Barrett, Underwood, Woodhouse, Browne-Mason, Hunt, Dennant, Sewill, Walker, and others, all men who are regarded as in the foremost rank of the Profession—practitioners and teachers of Dentistry. Indeed, I believe it may be truthfully stated that a large majority of Dental Practitioners use such agents; and so general has their employment of late years become, both in hospital and private practice, as a supply of a public demand, that the administration of anæsthetics is now regarded as embraced by Dental Surgery. The dental licensing bodies recognise this fact. At the examinations for the Dental Diploma of the Royal College of Surgeons of England written questions upon the actions of anæsthetics have been given on different occasions. It is known, too, that similar questions have been given at the *vivâ voce* dental examinations of the several licensing corporations. In the relation existing between Dental Practice and the administration of anæsthetics, we should not fail to remember that it was a Dentist—Horace Wells—who first discovered modern anæsthesia; and numerous improvements in their preparation and administration, particularly of nitrous oxide, have been suggested by Dentists. Neither should we overlook the introduction of the combination of nitrous oxide and ethedine dichloride by a much esteemed member of this society. The whole history of anæsthetics is intimately connected with Dental Surgery.

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* "Science and Practice of Surgery," by F. J. Gant, F.R.C.S.

The treatment of neuralgia comes within both the practice of the Physician and the sphere of the Surgeon. In the former case it is treated solely by medicinal agents, while in the latter operative interference, along with the administration of drugs, are frequently the lines of procedure. Dr. Bristowe* says that "in a large number of cases . . . . we can, so far as general treatment is concerned, only deal with them empirically." That the treatment of neuralgia, when associated with the fifth cranial nerve, does fall within the limits of Dental Surgery there is very substantial evidence to show. As I have already stated, Mr. Charles S. Tomes includes neuralgia in the list of subjects with which he deals in the Dental section of Gant's Surgery. So, too, in the text books on Dental Surgery chapters are devoted to the causes, pathology, and treatment of neuralgia. This is the case in Tomes' *Dental Surgery;* Salter's *Dental Pathology and Surgery;* Coleman's *Dental Surgery and Pathology.*

Likewise, in the Dental Department of General Hospitals have the Dental Surgeons appointed thereto in many instances treated cases of neuralgia. One case of "Intractable Facial Neuralgia," which is recorded in *St. George's Hospital Reports*, 1878, was so treated by the removal of a horizontally impacted canine tooth. Considerable pain followed the operation, and morphia injection was administered, cure following within twenty-four hours. We also read of the operation (Gross') of cutting down to and removing a portion of the edentulous maxillary bone to relieve acute nerve pain. This has been done by Mr. Coleman; † and at the Dental Hospital of London Mr. F. Canton‡ adopted a modification of that operation when internal remedies had failed. Mr. Charles Tomes§ has resorted to nerve stretching and nerve excision in the treatment of neuralgia of the dental nerves. At this juncture I venture to reiterate that this malady is treated not by surgical interference only, but also by the use of therapeutic agents.

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* "Theory and Practice of Medicine," by J. S. Bristowe, M.D., &c.

† "Manual of Dental Surgery and Pathology," by Alfred Coleman, F.R.C.S., etc. page 335.

‡ *Journal of British Dental Association*, vol. III., page 516.

§ *Transactions of Odontological Society*, vol. XII., page 171.

The conclusion which the foregoing observations, which, if it were necessary, could be considerably augmented, lead up to is that the treatment of neuralgia, medically and surgically, is regarded by many high authorities as coming within the sphere of Dental Surgery.

The ordinary operation of tooth extraction need not now occupy attention, but I shall make a few remarks upon the surgical aspect of the more difficult operation of removing impacted teeth and roots. Incising the gum and cutting away a portion of the alveolar process, with either trephine or other instrument, in order to dislodge an impacted or burried root is unquestionably a Dental operation. The removal of portion of the ascending ramus of the lower jaw to facilitate the extraction of an impacted molar ; also the extraction of a diseased tooth through an external sinus, are operations that have on different occasions been resorted to and performed by Dental Surgeons. Such operations necessarily involve a relatively considerable amount of surgical interference and after-treatment.

The removal of fractured and necrosed spiculæ of bone, or the excision of very pronounced and painful septæ from the alveolar region of the jaws, and the paring the boney alveolar margins are recognised actions in Dental Surgery.* Mr. Chas. Tomes writes, † "Hypertrophy of Gum and Alveolar Border may be removed by operation, the masses being pared away with a scalpel, or, if necessary, with bone forceps."

The treatment of Chronic Alveolar Abscess is exceedingly common, and this, too, where there exists an external sinus, or even a fistulous communication with the cavity of the mouth. The treatment in some of these cases, occasionally including the conservation of the tooth, the disease of which was the prime cause of trouble, extends over a period of many weeks or even months. This, of course, embraces the use of such remedial agents as the case requires, which may necessitate the administration of an aperient, a tonic, or alterative. Mr. Thomas Arnold Rogers, in his Presidential Address before the Odontological Society‡ said . . . . "These troublesome cases of suppuration having a dental origin . . . we used generally to relegate to the surgeon. But more properly they are Dental cases." The operation known as the amputation of the apices of the roots of teeth by cutting through, therefore removing portions of the jaw, is a principle of treating abscess that has several advocates.

Also the Treatment of Diseases of the Antrum, where arising from the teeth, is ordinarily undertaken by the Dental Surgeon, and many cases, both in hospital and private practice, could be cited.

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* C. J. Fox in *Transactions of Odontological Society*, 1864, page 188.

† Gant's Surgery.

‡ *Transactions of the Odontological Society*, vol. XIV., page 83.

Cases of Necrosis of portions of the Alveolar Processes of the Jaws, whether arising from Alveolar Abscess or other causes, not infrequently come under the care of the Dental Surgeon. These diseases, generally of a chronic nature, usually require a somewhat long period of local and constitutional treatment, pending exfoliation and healing. And the removal of the sequestrum also requires at times some little surgical dexterity. The text-books on Dental Surgery set forth these lines of treatment; and the literature of the Specialty contains the records of many instances in which they have been adopted. In the Dental Department of St. George's Hospital in 1878 the Dental Surgeon removed * the whole of the necrosed inter-maxillary bone; also a tooth and sequestrum ¾in. long. The late Mr. Sercombe, Dental Surgeon to St. Mary's Hospital, records † two cases which occurred in his practice at that institution, one of which was the sequel of Typhus and Ulcerative Stomatitis. Similar cases have also fallen within the practice of, I may say, nearly every Dental Surgeon to a General as well as to a Special Hospital whose experience thereat has been at all extensive. The *Transactions of the Odontological Society* and the Dental periodicals, not mentioning the numerous unrecorded cases, bear ample testimony to the fact that the Treatment of Necrosis of the Alveolar Portions of the Jaws is frequently undertaken by Dental Surgeons.

The division and also the excision of a portion of the normal gum tissue are legitimate actions in preparing certain cavities for filling. The removal of an abnormal growth of gum-like tissue, or tumour, which usually occupies a carious cavity, and is ordinarily denominated polypus, is also an unquestionable Dental operation; so also is the removal of a similar tongue-like mass of gum growing from between two teeth, and, it may be, overlapping one tooth, or even two or three teeth. Sometimes these small gum tumours, which it is the common practice of the Dentist to remove, assume larger dimensions, it may be the result of merely a longer period of growth, when they are regarded as forms of epulis—a term having no histological significance. Somewhere in the history of this early so-called polypoid and later so-called epuloid growth, there would appear to exist in the estimation of some persons, a kind of imaginary line of demarcation. The case, when regarded as being on the one side of this ideal and variable point is considered as coming within the scope of the Dentist, while if on the other side it is thought beyond his sphere. But I freely admit that I am not acquainted with any difference either in the cause or the clinical history of such a simple tumour of the gum, and I desire to be informed at what period it ceases to be special and becomes general. Of course there are some forms of tumour of the gum the malignancy of which is recognised and undoubted, but the form instanced is not of that nature. Tumours of the gum and periosteum of the Alveolar Process having their cause unquestionably in and associated with the teeth, and in which there was no indication of malignancy, have been removed by Dental Surgeons.

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* *St. George's Hospital Reports*, 1878.

† *Transactions of Odontological Society*, Vol. II.

Mr. Coleman removed a tumour from the mouth at the Dental Hospital of London, and in connection with this case said* "he would offer some observations upon a few of the most common forms of tumour met with in the region of the mouth, which came under the care of the Dental Surgeon." Numerous other cases which have been treated under similar circumstances might also be mentioned. The several text books on Dental Surgery not only describes these growths, their nature and causes, but also enter into details regarding their treatment. Each of the several authors records cases of his own experience as a Practitioner of Dental Surgery. Questions upon those growths are given by the Dental Section at nearly every examination for the Dental Degree of the several licensing bodies.

The use of therapeutic agents, both locally and internally, would appear to be recognised as included in Dental Surgery by those whose recommendations and opinions command respect and carry weight. In his lectures† delivered before the College of Dentists, in 1859, Dr. Richardson advocates the internal use of remedies in hæmorrhage after tooth extraction, neuralgia, etc. So do Mr. Salter,‡ Mr. Moon§ Messrs. Tomes,‖ Mr. Coleman,¶ Mr. T. A. Rogers,** and many other distinguished specialists. The effects of the administration of remedies, whether they be applied cutaneously—to the skin or mucous membrane—, subcutaneously, as by the hypodermic syringe, or injecting an abscess sac or a granulating sinus, or to the mucous membrane of the stomach—internally—, are in very many instances similar, however the medicine may be used. In each of such cases the medicine is absorbed by the surface to which it is applied, and the difference is one rather of absorption than of the mode of administration. Therefore the several modes of administering medicinal agents differ from one another in degree or quantity, rather than does the quality or nature of the responsibility of the administration. If this induction is correct, there can be no cause, no valid reason to question the practice of the Dental Surgeon using internal remedies as advocated by the few high authorities whom I have quoted. Yet, notwithstanding, there are some who would have us accept their views that the internal use of remedies is beyond the limits of Dental Surgery. In the face of such difference of opinion as to what is proper Dental practice, it has been stated* that there are "very few practitioners who are in any way at a loss to recognise the well marked boundaries of Dental Surgery," or "the well known limits of their speciality."

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* *Transactions of Odontological Society*, Vol. III.

† "Lectures on Diseases of the Teeth," by B. W. Richardson, M.D., etc.

‡ Holmes' "System of Surgery." § Bryant's Surgery.

‖ "Dental Surgery," 2nd Edition, and "Lectures on Dental Surgery."

¶ "Dental Surgery and Pathology."

** *Transactions of Odontological Society*, page 80.

4. Are the subjects enumerated as being on the border-land of General and Special practice to be regarded by the Profession as within the limits of Dental Surgery?

Having reviewed some of the actions, writings, and opinions of Practitioners of Dental Surgery that have reference to that border-land between General and Special Practice spoken of by Coleman,† Salter,‡ Charles Tomes,§ and others, I shall now submit the following questions:—

> Are the actions which are set forth as of frequent or common practice among Dentists:—Are the subjects written upon by Dentists, and contained in the special Dental sections of works on General Surgery:—Are the operations performed by Dentists in the Dental Departments of General Hospitals, and also in Dental Hospitals:—Are those actions which are so performed and so written upon in the recognised literature of the day, within the limits of Dental Surgery?

With the desire to avoid prejudice, or predicting a reply, I may venture to observe that the answer to these questions will be either affirmative, or imply that the operations that have been so performed, and are thus written upon by specialists, are beyond the limits of Dental Surgery. This latter would be an expression of opinion not compatible with the actions of those whom the Profession at large look up to as pioneers and guides.

5. Is the education required of the Dental Surgeon sufficient to enable the Licentiate in Dental Surgery to practise this branch of Medicine?

Hitherto I have, for the most part, been dealing with the subject of the border-land—the debateable ground—between General and Special Practice. The question of whether a person with or without this or that qualification should undertake those operations has not entered into the argument. I think that question may justly be considered independently of the theme, What is Dental Surgery? If the answer to the generalized question submitted in Section 4 ("Are those actions which are so performed and so written upon in the recognized literature of the day within the limits of Dental Surgery?") support and uphold those who would thus raise the status of Dental Surgery, I would enquire, Is the education required for the L.D.S. degree sufficient to enable the Licentiate in Dental Surgery to practise a branch of Medicine having such a scope? If it is not, then by all means let the degree be made equal to the requirements.

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* *Journal of British Dental Association*, Vol. III., page 195.

† "Dental Surgery and Pathology," page 274.

‡ "Dental Surgery and Pathology," page vi. (preface).

§ "Science and Practice and Surgery," by F. J. Gant, F.R.C.S., Vol. II.

Directly bearing upon this question we have the opinion and resolution of the Council of the College of Surgeons of England,* "That the Dental License should of itself be deemed a sufficient qualification to enable the holder to undertake the appointment of Lecturer on Dental Anatomy, Dental Physiology, or Dental Surgery, or of the post of Surgeon to a special Dental Hospital, or the Dental Department of a recognised Hospital."

This resolution gives support to the conclusion that the work done in the Dental Departments of General Hospitals, and also in Special Dental Hospitals, is Dental Surgery, inasmuch as it may, in the opinion and with the sanction of the Council of the Royal College of Surgeons of England, be performed by the Licentiate in Dental Surgery.

Dental Surgery is a Science and an Art. The Sciences and the principal sub-sciences which Dentistry embraces have been pointed out, and its connections or RELATIONS with several of them have been illustrated.

Regarding the QUANTITIES of the biological sub-sciences, particularly of the general practice of Medicine, of Surgery, and Materia Medica, I have reverted to some of the opinions, actions, and writings of the most able teachers and leaders in the Profession. The conclusion that is forced upon us is that, according to the works of those specialists, Dental Surgery embraces the study and treatment of diseases of the Teeth and of their contiguous structures—"contiguous structures" include neuralgia connected with the dental branches of the fifth nerve; impacted teeth; odontomes; dentigerous cysts; diseases of the gum and alveolar process, including simple tumours, chronic abscess, necrosis, and Dental diseases of antrum; the use (local and constitutional) of such therapeutic agents as the treatment of those diseases requires, this implying the administration of anæsthetics.

I now ask, does the Science and Art of Dental Surgery, as we would have it understood, embrace so much, or does it embrace less amounts, of those collateral sub-divisions of Medicine that I have just enumerated?

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* *Calendar of the Royal College of Surgeons of England*, 1877.

The subject is an important one, and I am fully aware that, from the fact of there being a borderland, the precise Limits of Dentistry must, like the practice of Medicine and of Surgery, be more or less arbitrary. Yet, in these days when the specialty is taking the position given it by the Legislature and the great body Medical—a standing of recognition which it has been struggling for during the last quarter of a century—the question of the Limitations of Dental Surgery was never more pressing than at the present time.

In the Discussion on this Paper, Mr. CROMBIE said:—The Paper just read deals with a matter of great importance to the Dental Surgeon, and one deserving the consideration of such a Society as this. To those of you who are fully qualified Surgeons it is of most importance, in order that you may determine with yourselves how far, as specialists, it is expedient you should go in operations and attendance on patients, not to encroach on the work of a General Surgeon. To those who are but Licentiates in Dental Surgery it is of less importance, because, before determining how far you shall go in the work of a Surgeon, you must know how far you are by your license entitled to go. Mr. Gaddes, in his Paper, overlooks the all-important item, and seems to consider all entitled to perform any operation they think they can manage; but the surgical status of a Licentiate in Dental Surgery is very ill defined, and it would be well if a proper conception of his legal position as a Surgeon were rightly known, in order that he might be enabled to determine how far he is justifiable and protected in undertaking the responsibility pertaining to a Surgeon, in view of any contingency that might arise from an operation. A fully qualified Surgeon practising Dentistry may perform any operation, however grave the responsibility, because his license protects him. Does the license in Dental-Surgery afford equal protection to its holder? As a matter of practical importance, and one involving serious considerations, it would be well to determine this before incurring any responsibility beyond that ordinarily attached to a Dentist.

Mr. WILSON said he had listened with much interest to Mr. Gaddes' Paper. It seemed to him impossible that any one could, after consideration of the array of facts laid before them in it, come to the conclusion that Dental Surgeons should, as Dental Surgeons pure and simple, be prohibited from treating cases such as those given by Mr. C. Tomes as occupying the border-land separating General from Dental Surgery. If such cases were to be recognized as beyond their province, then most decidedly their text-books and board examinations would require considerable modification. It might be very difficult to lay down the *exact* limits of Dental Surgery; but he had no doubt that, after a short time, a tolerably well-marked boundary would show itself as the present transitionary state of the Profession passed away. One point of limitation they undoubtedly had in the fact that it would be quite incompatible with his ordinary practice as a Dentist for a Dental Surgeon to take up cases the after-treatment of which involved his visiting the patient; and this inability would also tend not only to deter his taking up doubtful cases, but compel his calling in the General Surgeon in all cases where serious complications unexpectedly showed themselves.

Mr. FINLAYSON said that the subject of the Paper just read was an important one, and had been very ably handled by the author. It was also, however, a very delicate one, and would need to be discussed with that care which such a question demanded. Much might be said to offend the feelings of the Medical Profession, which never obtruded on the Dental Specialty; but, on the contrary, almost invariably referred Dental cases occurring in practice to the Dentist. Had the Paper been left before the Society, as Mr. Campbell had hinted at, remarks of greater and more comprehensive character might have been forthcoming; but, taking it as delivered, he was inclined to adopt the negative view, as opposed to the affirmative, that Dental cases of whatever sort should be treated exclusively by the Dental Surgeon. Such had not hitherto been the practice in the Edinburgh Hospital, as major operations were almost invariably done by the Consultant Dental Surgeon, who was also a Surgeon, or by a General Surgeon of repute. A day might, however, come when Dental Surgeons would be capable of performing as such in any case that might occur in practice; and there were many already who had done so, but who, in addition to being Dental Surgeons, were also Surgeons. The border-line required to be drawn somewhere, however; and he was of opinion that, in the meantime, and during the present generation of Dentists, for obvious reasons which need not be further referred to, that purely Dental operations should be performed by the Dentist; and that operations of the major and more serious sort, such as referred to in Mr. Gaddes' Paper, should be relegated to the Surgeon proper. Constitutional remedies were what almost every one knew something of from personal experience; and the prescribing of an alterative or any other simple matter of that sort was, he thought, not only allowable, but absolutely called for when needed. The Dental Surgeon of the future would occupy generally a much higher position as regards medical and surgical knowledge, and also be a man of greater culture than the Dental Surgeon of the present; and then would be the time to agitate the question for a settlement.

Mr. G. W. WATSON, for the most part, quite agreed with what Mr. Gaddes had said in his Paper in regard to the scope of Dental

Surgery, and thought it quite in the province of the Dental Surgeon to undertake operations for treatment of Dentigerous Cysts, Odontomes, and Antral complications, consequent on the presence of diseased teeth. In the case of tumours, it would be well, perhaps, to confine ourselves to the simple or non-malignant varieties, and more particularly those having a Dental origin, although there is frequently great difficulty in differentiating between malignant and non-malignant growths. Mr. Finlayson, in his remarks, makes a mistake in saying that no case of so-called antral abscess has been treated in this building. He treated a case quite successfully this summer, which was referred to him by Dr. J. Bell, besides several others in private practice.

Mr. BIGGS said: We are all indebted to Mr. Gaddes for his very interesting and valuable Paper, for in this age of progress and Dental education, it is important to have such matter reflected upon occasionally. He was not prepared to speak so fully upon it as he should like; but he held that it is a difficult matter to draw a hard and fast line of demarcation between Surgery and Dental Surgery. Surgery pure and simple would not be profitable to any Dental Surgeon with any sort of practice. At the same time, Dental Surgeons ought to be able to undertake all operations connected with the oral cavity, whether they undertake them or not. And if he might be allowed to sum up the whole matter in a few words, he would say the ability of the operator would be the only limit to the operations of the Dental Surgeon in his proper capacity.

Dr. WILLIAMSON thought that the Society was much indebted to Mr. Gaddes for his endeavour to show what, in the legitimate exercise of his profession, a Dentist may do or has done. All, or almost all, however, of the operations cited, had occurred in hospital practice, either special or general. In the latter case, a great deal depended on the relations that existed between the Surgeon of the hospital and the Dental Surgeon, along with his inclinations in the matter, as to whether these border-land cases be undertaken by the one or the other. Such examples of disease as Necrosis after the Exanthemata the Dentist would rarely see outside of hospital practice, as, if occurring in private cases, they would, as a rule, be treated by the medical practitioner in attendance. Dr. Garretson, of Philadelphia, represents the extreme view in his ideas of what a Dentist should be qualified to perform; he believes that every one should be an "oral" Surgeon, which involves the performance of all operations, however formidable, on the tongue, lips, upper and lower jaws, etc. Now, such an extension did not seem to be justifiable, as the ordinary Dental routine was incompatible with the performance of operations which might place life in jeopardy, and which would necessitate a constant out-door attendance for their after treatment, so that such cases are necessarily much better left in the hands of the General Surgeon, who also, from his ordinary experience, would be much better qualified to cope with such emergencies as might arise. As a whole, then, it was evident that the limitations of Dental Surgery were not so much the limitations of anatomy as they were those suggested by expediency and common sense.

The CHAIRMAN (Dr. Smith) then said that, if no further remarks were to be made, he had taken some notes on the important and interesting communication by Mr. Gaddes, and on the discussion following it, which he would now offer the Society previous to bringing this subject to a close. But before doing so, he felt sure that he was only expressing the unanimous feeling of the members present when he said that Mr. Gaddes deserved their most cordial vote of thanks. The position of the Dental Licentiate, and the extent of his privileges and field of practice—as compared, on the one hand, with the practitioner who had no legal qualification whatever, and, on the other, with those who, in addition to their skill and acquirements as Dentists, possessed also a full medical or surgical diploma—was, he said, a subject presenting several points not easily disposed of without mature and deliberate consideration. The inquiry of this evening seemed to resolve itself into the endeavour to obtain a correct and specific definition of the meaning and extent of what is termed "Dental Surgery," and of the kind and the range of practice to which the diploma of Dental Licentiate was supposed to entitle its possessor. It had been set down by the highest legal authority in England that the designation of Surgeon, as an affix or prefix, might be assumed by any one who chose to take it—a deliverance which, to all intents and purposes, implied that the word Surgeon had no meaning at all. This might be so; but up to the time of this very learned interpretation of the term, it had been generally accepted, in reference to practitioners of the healing art, as one showing that they held some recognised surgical qualification. It might, no doubt, be the case that any one might affix the word to his name, in the same way that any one might affix the word reverend, or captain, or admiral, or professor; but it was quite a different matter when he acted upon the strength of such designation. And in any case where he might have to produce the right and title he had to such designation, the reverend gentleman, or the captain, or the admiral, or the professor might, in some unexpected and awkward situation, when discovered not to be what he led the general public to believe he was, find himself exceedingly apt to get into trouble. The Dental Licentiate, however, he held as quite entitled to assume the prefix or affix of "Surgeon;" and unless the word had no meaning at all, such Licentiate was, as a special Surgeon, legally qualified, entitled to practise the healing art in certain, if not all of its departments. No doubt it was to those Dentists possessing no legal qualification that reference was made, in the decision alluded to, respecting the title of Surgeon-Dentist, and whether or not the assumption of it was strictly justifiable, according to a correct interpretation of the law, it would have been perhaps invidious, on the establishment of the new license in Dentistry, to make a retrospective erasure of the title by which these older practitioners had been so long known. But the difficulty under consideration this evening was not the general import of the term "Dental Surgeon," "Surgeon-Dentist," "Licentiate in Dentistry," etc., as a legal guarantee to practise a certain amount of Surgery; but it was to define the exact limits within which the practice of such Licentiates, etc., must be confined. Now, there seemed to be no actual line of demarcation possible to be laid down here. The practitioner's own discretion—first in the knowledge of his own ability, of what he ought to, and what he could conscientiously undertake; and, secondly, the bearing in mind of what a jury might think of his having done so—would always be the principal guiding circumstances to be considered. There was no doubt that a limit had been intended to be exercised in the case of the Dental Licentiate's sphere of practice. That limit might be, and doubtless was, vague enough. There was a border-land on which he might encroach; but, in doing so, he incurred a responsibility. There was a boundary to his field of practice somewhere; but that somewhere he had been left to find out for himself, and accept the result. The whole responsibility, in fact, had been thrown upon his own judgment in the matter. Any encroachment, however, on this undefined border-land by the Dental Surgeon would assume a very different aspect, according to circumstances; and it might be fairly said, in a general manner, that wherever the treatment of a case had been commenced in circumstances ordinarily falling to the care of the Dentist, its treatment to the end, the treatment of complications arising in connection with it, and even of certain conditions in the general health of the patient, apart from the original disease, but occurring during its progress, might be legitimately undertaken by the judicious Dental Surgeon. It is unnecessary to to say, here, however, that a judicious practitioner would not exceed his prerogative, but would call in the assistance of the Physician, or General Surgeon, as soon as ever he thought this necessary or even becoming. It was here that the Dental Surgeon's qualification differed from that of the Surgeon-Accoucheur, the Surgeon-Occulist, the Surgeon-Aurist, or the Surgeon-Specialist, of other kinds, properly so-called. These last were fully qualified practitioners, with their special acquirements and experience superadded to this. Such specialists ranked not with but above the ordinary practitioner, and deservedly so. They had superadded to his studies, and examinations, and degrees, the labours, the knowledge, and experience required to master some special subject; and it might so happen that some day the Dental Surgeon would, like them, be the Surgeon, who had added to his general qualification a clear and luminous and comprehensive knowledge of and ability to treat his own specialty, and would take the same high position as the practitioner who devoted himself to diseases of the brain, the heart, the lungs, eyes, ears, kidneys, and other special departments of medicine. But until that time came, it would not do for the Licentiate in Dental Surgery to undertake, *ab initio*, some case unconnected with the teeth. It was open to question whether even such cases as diseases of the jaws, palate, tongue, oral mucous membrane, or nerves, if unconnected with the teeth, would fall under Dental Surgery. And unless, for example, a tumour of the jaw, even connected with the teeth, appeared of such a nature as to afford a prospect of cure by some strictly Dental operation, it was difficult to say whether a mere Dental Licentiate would be justified in undertaking its treatment. Such cases, as had been already said, generally required the Surgeon to visit the patient, and not the patient to visit the Surgeon; and where a number of patients and a number of visits of the kind fell to the Surgeon-Dentist, it was more than could be expected that his Dental practice, properly so-called, would not suffer by it; and it was more than likely that full justice could be done to neither of the cases falling under his care as a Dentist pure and simple, or as a Special Surgeon. It might be predicted, however, that these difficulties would yet be met, and the problem solved, possibly by a still further specialisation of Dentistry—the Dental Surgeon becoming less of the Dental mechanician, and the mechanician less of the Surgeon, and both assuming a higher status and greater perfection in their respective departments. Or possibly, under the changes foreshadowed in the Report of the Royal Commission on Medical Education, the colleges and other licensing bodies might be deprived of the powers of granting any diplomas as absolute qualifications for practice, but be restricted to conferring them merely as what might be called special badges or professional honours, obtainable only by those who had previously passed the General Examination of a conjoint Central Board; so that in this way practitioners of every denomination would at least possess a uniform qualification upon which any further diplomas or degrees might be based. The question, Dr. Smith remarked, was a large one; and the whole Profession, he considered, indebted to Mr. Gaddes for bringing it forward this evening as he had done.

Mr. Gaddes, in reply, said he was glad the subject of his Paper had been received so favourably by the meeting, and especially did he appreciate the remarks of their distinguished President. The objections that had been made to a Dental Surgeon ordinarily performing such operations as those he had mentioned might be resolved into a question of convenience. If it were not convenient for the Dentist to visit his patients, or to receive several visits, he need not undertake work that involved such treatment. He was pleased to learn that the removal of tumours of the gum and alveolar process was practised not only in the Dental Departments of General Hospitals and in the Dental Hospitals of London, but also in the Dental Hospital of Edinburgh, and also that anæsthetics—nitrous oxide, nitrous oxide and ethidene dichloride, and chloroform—were administered by the regular staff of Dental Surgeons. He would impress this fact upon the Society, namely, that in his Paper he had not made any definite statement of his own as to the Limits of Dental Surgery; but he thought that, having instanced examples of what had been done under the pale of Dental Surgery, the conclusion to be drawn was inevitable.

THE ODONTOLOGICAL SOCIETY OF GREAT BRITAIN.

The first ordinary monthly meeting of this Society for the present session was held at 40, Leicester Square, on Monday evening, November 6th. Mr. Samuel Lee Rymer, President, in the Chair.

The President, in opening the proceedings, expressed his pleasure at again meeting the members after the recess, and remarked that since their last meeting an interesting occurrence had taken place, namely, the meeting of the British Dental Association in Liverpool. That gathering was a very successful one, and conspicuous for the number of their members present, including no less than six past presidents of their Society. To him that was a very gratifying sight. There was also a matter for great regret which must be mentioned in the loss sustained by the Society by the death of two of their distinguished members, Mr. Clover and Mr. Alfred Canton. The former well known throughout the world as a man of science, and particularly with reference to Anæsthetics; the latter distinguished for his professional attainment and his kind social bearing. Therefore, in the name of the Society, he (the President) proposed that the sympathy of the Odontological Society be conveyed to the relatives of their diseased friends, a resolution in which he was sure they would all agree.

The President remarked that several additions had been made to their literature. Mr. Stocken, one of their members, had presented a copy of the third edition of his work on "Dental Materia Medica;" also that the Transactions of the New York Dental Society, and other things, had been received.

Mr. Coleman mentioned the case of a little boy suffering from epiliptic attacks which were probably caused by the irritation of an upper temporary molar. The fits ceased on the removal of the tooth; but, as the patient was at the same time receiving medical treatment, there was some doubt as to whether the former or the latter treatment was the successful one. He also showed an upper wisdom-tooth that he had recently removed from the mouth of a gentleman in his 89th year, and which was erupted only two years previously. There were also some large exostoses on the lower jaw, which at one time had caused both Mr. Coleman and the patient some anxiety, but of late years these had diminished in size. Mr. Coleman next cited an instance of the pulp canal of a tooth being completely filled up with secondary dentine, and he had to drill into this in order to fix a pivoted crown.

Mr. Redman showed a tooth, the pulp-cavity of which was completely filled up with secondary dentine. The patient, a lady, had been suffering for many years, and several Dentists had refused to extract the tooth, which was quite sound. After reflecting a very strong light and observing great opacity, he extracted it, finding the pulp to be calcified.

Mr. Charles Tomes said that in a Paper which he had read at the meeting of the British Dental Association in Liverpool, on "The Influence of Septic Organisms on the Production of Dental Diseases," he had asked the question, "Do we ever get inflammation about the root of a dead tooth which is not of septic origin?" It was not an easy question to answer; he had lately had an opportunity of carefully examining a tooth which had been killed by an accident four years ago; it was tender, yet there was no sign of abscess. On extraction there was clear evidence of inflammation about the apex of the root, but on splitting the tooth the remains of the pulp was found as a whitish mass, filling the pulp cavity, and not in the least offensive; nor could any bacteria be found in it. So far as it went, this case seemed to indicate the possibility of the existence of inflammation about the roots of dead teeth which was not of septic origin; but further evidence on this point was necessary, and he should be greatly obliged if any member who might happen to meet with a similar case would carefully observe the state of the pulp immediately after extraction.

Dr. Alfred Carpenter then read a Paper on "A Consideration of Some of the Causes which led to Dental Decay."

ODONTO-CHIRURGICAL SOCIETY.

THE ordinary meeting of this Society was held at 30, Chambers Street, Edinburgh, on Nov. 9th, Mr. JOHN SMITH, M.D., F.R.C.S., President, in the chair.

The Paper on THE LIMITATIONS OF DENTAL SURGERY, read by Mr. GADDES, and the discussion that ensued, will be found on page 536.

CASES OF INTEREST.

Mr. WILSON exhibited a canine, which he had removed from a dentigerous cyst, since their last meeting. The patient, a boy about 14 years, was sent to him by a medical gentleman to have a necrosed root removed, the case being regarded as one of tumour in the antrum. The removal of the root (that of a temporary canine) was followed by a free discharge of fœted pus. The absence of the permanent canine led him to suspect that it was most likely involved, and he wrote to the doctor that it would probably turn out a dentigerous cyst. The result was that an appointment was made for further examination.

Making an opening through the distended wall of the antrum, he introduced a probe, and soon detected the missing tooth, which was slightly moveable, enlarging the opening so as to permit the introduction of the forceps; he, with some little difficulty, caught the tooth and removed it. The cyst was then thoroughly evacuated, and finally washed out with Phenate of Potash. The crown of the tooth was, as they would see, beautifully developed, while the root was quite stunted and malformed. The attachment of the sac to the neck of the tooth was very strong, as evidenced by the portion brought away with the tooth.

He had also to bring under their notice a case showing two laterals on the right side of the upper jaw, one being fortunately outside an otherwise well-formed arch.

The case was one of special interest, in so far as there had been *six* well-formed incisors in the temporary set, a model of which he had shown the Society two years ago.

The second temporary lateral still remains on the left side, and he hoped to keep the case in view, so as to see whether there would be a pair of permanent laterals on that side also.

Mr. BIGGS wished to draw the attention of the Society to a case of some little interest. Yesterday a lady consulted him about a baby, whose front teeth were, she said, knocked out five days previously, that she had called in the family physician, who made but a superficial examination, and said it was of little consequence, and that the wounds would soon heal up. But as the swelling increased they got alarmed, and consulted him about it. He got the child properly secured and probed the wound, when he discovered the teeth driven deep up in the alveolar process, and quite out of sight. He wished to have the opinion of the members present as to the probable result to the permanent teeth ? whether they had ever seen a similar case ? and what they would propose to do ? He had seen but one case before, the result of an accident in the cricket field. In that case also the medical officer was at fault, thinking the teeth were out, and unable to account for the great and gradually increasing swelling. They were about to operate for removal of diseased bone. The lad, 18 years of age, was brought to him—only two hours before the operation was to take place—when he found the two centrals driven right up through the floor of the nasal cavity. He drove them down with an elevator, which he introduced through the nostrils, replaced them in position, and put on a ligature. The lad sailed in two days for Australia, and he never heard more of it, but did not expect they ever became useful.

Female æt. 6 *Months.*—Mr. WATSON.—The model of this patient, which I hand round; exhibits a complete cleft of both hard and soft palate, with entire absence of the inter-maxillary bone. Associated with this there was a very unusual form of hare-lip, neither Professors Chiene nor Annandale having seen a similar case before. The cleft in the face and lip commenced at the inner cauthus of the left eye close to the punctures, passing downwards, and converging from this towards the angle of the mouth on one side, and on the other down the side of the nose and alar cartilage to the median line of the lip. This deficiency in the tissues exposed the whole of the oral and nasal cavities to view, which gave the child a very repulsive appearance. This defect in the face and lip was operated on by Dr. Bishop, with my assistance, and turned out a very successful operation. In other four or five years the cleft palate is to be remedied by operation. The child looked strong and healthy, although the mother informed me she had the greatest difficulty in keeping it in life, owing to its inability to take food in the ordinary way.

Case 2. *Female æt.* 16.—This model shows the presence on the labial posterior segment of the superior maxilla of a myeloid sarcomatous tumour, which, in all probability, has had its origin from several diseased molars, which, you will observe, are embedded in it. This was also removed by Dr. Bishop.

Several interesting specimens of teeth, human and artificial, presented to the Museum by Dr. Hogue, were exhibited.

Mr. BIGGS said: Mr. President and gentlemen,—I have much pleasure in bringing before your notice an automatic gas extinguisher, applicable to vulcanizers. I have used this constantly in my workroom since the end of July, and have found it most reliable. It is very simple, as you see, being attached to the gas tap, which it shuts off at any given time. Any timepiece with an alarum may be used.

This clock, called the "Peep-o'-Day," has simply a piece of brass soldered on each side of the arrangement for winding the alarum. When the clock is wound you set the hand of the alarum to indicate the hour required, then secure the clock in situation, and place the gas tap between the pieces of brass. When the alarum bell rings the brass part revolves and shuts off the gas; and is so sure and punctual, that it is better and more reliable than an assistant.

The Chairman then intimated that the next meeting would be held on December 14th, when a paper would be read by Mr. Wilson on "The Classification of the Teeth in Mammalia."

SOCIETY OF LICENTIATES IN DENTAL SURGERY.

The Annual Meeting of the above Society was held in Anderson's College on the evening of Wednesday, 15th Nov., the President, Mr. J. R. Brownlie, in the Chair.

The minutes of last meeting having been read and approved, James McCash, L.D.S.Glas., was balloted for and admitted.

The Secretary read the annual report, from which it appeared that a greater number of Papers were read and discussed than during either of the two preceding sessions, viz., "Vulcanite and Celluloid," by Mr. James Cumming, sen.; "Old Instruments and New Ones," by Mr. J. Foulds; "Salivary Calculus," by Mr. John Melville; "Impression Compounds," by Mr. W. F. Martin; "Tooth Extraction," by Mr. W. H. Grey.

Many interesting cases and specimens were brought forward at the meetings. Amongst others Mr. J. S. Woodburn showed a novel method of employing small inflated rubber bags for making good the deficiency in cases of cleft palate.

The meetings were well attended throughout; there were nine additions to the membership, and no withdrawals during the season. The number on roll now is 27.

The Treasurer's report was also highly satisfactory, the income from subscriptions having considerably increased, and, after meeting all charges, leaving a considerable sum in the hands of the Treasurer.

The following office-bearers were balloted for and duly elected:—

President	Mr. J. S. Woodburn.
Vice-President	Mr. James Cumming, Sen.
Secretary	Mr. Donald Cameron.
Treasurer	Mr. John Melville.
Curator and Librarian	Mr. A. B. Young.
Editor of *Transactions*	Mr. J. R. Brownlie.
Councillors	Mr. John Foulds. Mr. William H. Grey. Mr. Benjamin Sutherland.

The retiring President, Mr. Brownlie, then left the Chair, and on taking his place as President, Mr. Woodburn was most cordially received. Mr. Melville then proposed a vote of thanks to the ex-President for his unwearied efforts on behalf of the Society, which was heartily responded to, and Mr. Brownlie briefly replied.

Amongst the cases of interest there were shown and presented to the Museum, two plates of tartar, which had formed adhering to the buccal surface of the second upper molar of each side of the same mouth. Somewhat circular in form, and exceedingly hard, about 12 inches in greatest diameter, and $\frac{3}{8}$ inch thick at the thickest part; their removal had the effect of altering considerably the contour of patient's face.

It was proposed to make the next meeting special and in connection with the Annual Dinner, for the sake of those members not residing in Glasgow or neighbourhood, and a committee was appointed to carry out this idea, if possible.

With the usual vote of thanks to the Chairman, the proceedings terminated.

NATIONAL DENTAL HOSPITAL AND COLLEGE.

THE Annual Dinner of the Past and Present Students of the National Dental College was held on Thursday evening, Nov. 23rd, the chair being taken by W. H. BROADBENT, Esq., M.D.

At the termination of the dinner the Chairman rose and said he had to ask them to drink to the health of their Gracious Sovereign the Queen, knowing full well that their enthusiasm went before his words, and that the only difficulty was to find fitting expression for their thoughts. They must admit that they had been singularly fortunate with regard to their Queen, knowing that during her reign almost every country in Europe had undergone revolutionary excitement, and more than half the monarchies had to take to flight at one time or another. The exalted station of Her Majesty had only served to show her love of mankind. The fierce light which beats upon her throne had only served to reflect her spotless character, and her influence had only been used for public good. (Hear, hear.)

Dr. STRONG proposed the toast of "The Consulting and Medical Staff." Having referred to the members of the consulting staff, Dr. Strong said that, coming nearer home, he would note those gentlemen who composed the medical staff of the institution. As they all knew, these should be gentlemen of the highest order, and the list of names before him guaranteed that they were. To those who were present he could not but tell them how he remembered the sayings which fell from the lips of his teachers, and he was sure that those young men now around would, in after-life, look back to that medical staff as those to whom they owed their success in life. (Cheers.) Therefore it was with much pleasure that he proposed the toast of "The Consulting and Medical Staff," associating with it the name of Mr. Harry Rose, who was one of their teachers.

Mr. HARRY ROSE, in responding, remarked that Dr. Strong had said so many flattering things about the Consulting and Medical Staff that it was scarcely needful for him to now occupy the attention of the company. But he was quite sure that they all endeavoured to do their duty, and that during the twelve or thirteen years of his association with the institution he could safely say that throughout that time some one had been interested in it, namely, the students who had flocked thither in greater and greater numbers; therefore, it only remained for him to thank Dr. Strong for associating his name with the toast, and also to thank those present for the manner in which they had received it. (Cheers.)

The CHAIRMAN rose to give the toast of "The National Dental Hospital and College," and said that he must claim for the toast which he was about to propose the honour of being the toast of the evening. He had to propose "The Prosperity of the National Dental Hospital and College"—(cheers)—and he did so with great personal pleasure, knowing that it would be received by them with enthusiasm. He would say that the prosperity of the College was guaranteed when they saw such attachment to the institution as was shown by such a meeting of those present before him that evening. (Cheers.) He thought that was one of the strongest signs of vitality. He was sure that there was a great future for the Hospital, and that it was astonishing the amount of work which was done, not in quantity but in quality; and that it was a source of great gratification to see the resources of Dental Surgery placed at the disposal of the poor of London, they not coming simply to have their teeth removed, but to have the benefits of conservative Dentistry applied to their necessities. They all knew that there was nothing so deservedly costly as the skill of those trained specialists who gave their services to the National Dental Hospital. (Cheers.) To the College he was sure that there was also a great future, there being nothing more remarkable than the high position which Dental Surgery had taken. They all knew that the object was the relief of human suffering, and that it was that which dignified any calling. In order that any profession should take its proper position before the public, in order that due privileges should be accorded to those who carry on that profession, it was necessary that some organization should be formed to secure that result. It was only in 1837 the Royal College of Surgeons was called into existence by Royal Charter, and already they had formed a special branch of Surgery. (Cheers.) Referring to the institution, the Chairman said that the founding of the Hospital was a most patriotic work, and he believed that the founder was present before them. (Cheers.) He thought that the name of the founder would be handed down in connection with the Hospital, which would be a very important institution of the Metropolis. He knew that they were all proud of their Hospital and School, and that he felt very proud in having been called upon to propose "The Prosperity of the National Dental Hospital and College." No name was placed in connection with that toast, but he was quite sure they had a right to name the present representative, the Dean, Mr. Gaddes. (Loud cheers.)

Mr. GADDES thought it was unfair to call upon him, it having been carefully designed that the Dean should not take any part in the speeches; therefore he had been enjoying his dinner, feeling wholly freed from the grave responsibility of having to speak. But, having been called upon, he thought it his duty to respond. He felt very much obliged to Dr. Broadbent for mentioning his name in connection with the toast, and also to the gentlemen present for their very warm acknowledgement of him. Upon the spur of the moment he thought the best thing that he could do would be to give them some account of what they had been doing during the past year. Since the month of May they had had an entry of five full students and eight partial ones, making a total of thirteen new entries during the past six months. That fact showed that there was enough teaching for the staff to do, but being one of the teachers himself, he must refrain from saying anything about their virtues or their shortcomings. He must remark, however, that all the students of the College that had been sent up to the Royal College of Surgeons of England had been successful in their examinations. (Cheers.) They had not had one failure, which was something to be able to say. (Hear, hear.) Mr. Gaddes thought that that fact was sufficient to show the nature of the teaching imparted by the staff of the National Dental Hospital and College. It was a matter of great satisfaction to the staff, and to the numerous students who met together year after year, to have such an opportunity as the present of meeting one another—workers, teachers, and fellow-students. They had present that evening gentlemen from great distances; one from Rouen, another from Liverpool, another from Macclesfield, another from Weymouth—in fact, from all ends of the earth;—(cheers)—therefore he was quite sure that such a gathering as The Annual Dinner of the Past and Present Students and friends was a matter of gratification to every one present. Before sitting down, he had to thank them, not only for the kind manner in which his name was received, but especially for the cordial help which had been given to him, as their Dean, by the staff, and also by those with whom he was so much associated, namely, the Students of the National Dental Hospital and College. (Loud cheers.)

Mr. RYMER next proposed the health of "The Past and Present Students," and remarked that the toast which he had the honour and pleasure of proposing, followed, naturally upon the one which preceded it, they knowing that the Hospital and College would be nothing without Students; the Institution had been a babe, but a very robust one, certainly not born with a silver spoon in its mouth, it having had rough work to do. He had watched the progress of it from the first, and had marked the happy progress of the students past and present, and he would make bold to say that a more gentlemanly and attentive company of students than at present there could not be, and that many of their past ones had attained positions of honour. The best thing the present ones could do was to follow the example of those who had so worthily gone before, and then they would be as shining lights to the Profession, and an honour to their country. Mr. Rymer said that twenty-five years ago there were no such educational advantages as those which the present students are now reaping the benefit of. At the Medical Congress they saw that Dental Surgery was made a special branch of Surgery, and that of the papers read he thought there was not one of more practical importance than that by their friend Mr. Gaddes—(cheers)—which was on the immensely important subject of providing assistance to our soldiers and sailors when suffering from Dental diseases; therefore, it was with very much pleasure that he proposed the toast of the Past and Present Students, associating the names of Mr. Morgan Hughes and Mr. Chas. Rose.

Mr. HUGHES in responding said that it was an extremely difficult thing for one who had only lately qualified to speak as a past student, when there were present so many past students who had done good work since they left the Hospital; therefore, he felt scarcely qualified to reply to the toast, especially after the manner in which Mr. Rymer has spoken of the services which the past students have done already. But he was sure that he was only expressing the feelings of the past students when he remarked that all those students looked back with the greatest pleasure at the time spent at the National Dental Hospital. With reference to their success at the examinations spoken of by Mr. Gaddes, he felt sure that it was greatly owing to the exertions of that gentleman—(cheers)—and that their success was not limited to the English examinations, but it extended to the Irish and the Scotch. Mr. Hughes concluded by thanking the gentlemen present for the manner in which they had received his name.

Mr. CHAS. ROSE replied to this toast as a present student, remarking that, as he was elected to respond, he could scarcely say which of his feelings was uppermost, whether it was his chagrin at having to do it, or the great pleasure he felt in having gained the confidence of his fellow-students. (Cheers.) He said Mr. Hughes had mentioned Mr. Gaddes' name, and that he would, on behalf of his fellow-students, tend his humblest thanks to Mr. Gaddes and others for the untiring energy and zeal which they had displayed in giving them a practical knowledge of the details of their Profession, and, with Mr. Gaddes at the head of affairs, he thought that they could only show the self-confidence they had in the view of success. With regard to the work they did it was not for him to speak, but he was sure that they did good work—at any rate, they were not ashamed of it. (Cheers.)

Mr. OAKLEY COLES rose to the toast of "The Visitors and Dental Schools," and said that, unaccustomed as he was to public speaking, he felt a natural diffidence in appearing before them; but in accordance with that power which had controlled the affairs of that evening, he rose to propose the above toast. If they would allow him he would be somewhat specific, and mention, in connection with the visitors, the name of Mr. J. S. Turner—(cheers)—and, with reference to the Dental Schools, he would mention the National Dental Hospital and College, the London School of Dental Surgery, the Edinburgh School of Dental Surgery, the Glasgow, Liverpool, Birmingham, and the Plymouth Schools, this making up a very fair array of Dental institutions. Mr. Coles said that before Dental Schools existed they had had Dental literature, and he thought he was right in saying that there was no other speciality which could claim two thousand years of literature in the same way as Dental science could. From the time of ancient Greece down to the present there had not been a single century which had not contributed to Dental literature; century by century they had gone on accumulating. Mr. O. Coles thought that a general impression prevailed that Dentistry was a modern production, or a modern institution; but he begged to say that ancient Rome knew something of deformities arising from the teeth, there having been found an old leaden pair of forceps in a temple at Rome which showed that Dentistry had grown to a high state of skill, representing that teeth should not be removed before they were loose enough for the leaden forceps to extract them. In investigating that subject he was surprised to find that in the fifteenth or sixteenth centuries there were from forty to sixty theses written on Dental Surgery in different parts of Germany; therefore, there was for two thousand years a recognition of this as a department of general medicine. This was the prelude to more important manifestations which had developed in the form of Dental Schools. These they could scarcely claim to have founded in the world, as Dental Schools were first established in America. Be that as it may, it was like twins, it was only a little in advance to be first. The Metropolitan School of Dental Science was the first institution of the kind in the United Kingdom. (Cheers). Since that time Dental Surgery had made tremendous progress; it had been reduced to the legitimate object of conservative Dental Surgery. The literature which had led them on to the organisation of the Profession in the form of Dental Schools had also led to the formation of the British Dental Association, and thus to the good of the whole Dental Society—that being, he said, like a trades union, involving not merely discipline, but self-sacrifice and the sinking of individuality. Mr. Coles said that there was present with them one who had shown that spirit of self-sacrifice for the great good, namely, the Secretary of the British Dental Association—Mr. J. Smith Turner. (Cheers). He hoped he had not omitted the mention of any Dental School, but he was quite sure that through the medium of that higher intelligence, that of the Press, that they would convey the sentiments and the sympathy which had been accorded on that occasion.

Mr. J. Smith Turner, in reply, said he remembered reading, a long time ago, a little book on the plurality of worlds, but he thought that the doctrine of plurality was dying out. Knowing the difficulty there has been to eradicate evils from our social affairs, legislation has at different times been brought to bear upon them. The plurality of wives was almost extinct in Europe; it, having gone from the East to the far West, settling down in the Salt Lakes, was now engaging the attention of American legislators. These few remarks of his were put forward to show the difficulty there was to stamp out evils that found their way into the social fabric. He thought that he was standing in a position of representing a plurality of responsibility (not in a ritualistic point of view), and as he had never known of such a circumstance, he could only put it down to the peculiar leaning their Profession had to Amalgam. That responsibility had made him feel like Will Waddle, who was like two single gentlemen rolled into one. After some further observations, Mr. Turner thanked them, on behalf of the visitors, for their generous hospitality. Referring to the Dental Schools, Mr. Turner said Mr. Rymer had spoken of twenty-five years ago. That reminded him of the greatest meeting which had ever taken place, and which was summoned by Mr. Rymer,—cheers—

and that is why, in his modesty, he does not like to hear it mentioned. But since that time their course had been exceedingly rapid, and he could well remember when Mr. Rymer tried to stir up a little enthusiasm on the matter of Dental reform. Now they had got the Act of Parliament, and this was strangely interpreted by some, but it was not so bad after all. Referring to the number of schools, Mr. Turner said that there were so many now that when one close atmosphere did not suit the delicate student, he could go to the south or to other parts. Speaking of the National Dental Hospital, Mr. Turner said he had watched its progress with great interest, and that at one time in its history it was at a low ebb, but he strongly advised its being continued, and he thought that there had been no reasons for regret since. In conclusion, he thanked them all for the hearty way in which they had drunk to the success of "The Dental Schools."

Mr. TURNER said that there was a great society where they might all meet, and he would propose the health of the Odontological Society, coupled with the name of the President, Mr. Rymer.

Mr. RYMER briefly replied, thanking them in the name of the Society, and trusted that every student present would, sooner or later, become a member of that Society.

Mr. WEISS said that he was called upon to propose the Health of their Chairman. No Meeting could be properly organized without a Chairman, and he thought that the enjoyment of that evening depended greatly upon their distinguished President, Dr. Broadbent, a name which was well-known throughout civilized Europe. He was also one of the consulting staff, and, undoubtedly, he bore a strong affinity to them in all their prosperity. Whatever opinions might have existed in the past, they certainly must now acknowledge that the Medical Profession had been ready to meet them in any way to advance their interests. In conclusion he said that there was scarcely any necessity to do more than simply propose the toast of "The Chairman," as he was so well-known; but they would wish him prosperity, and drink his health in a cordial spirit, which he so richly deserved.

The CHAIRMAN having responded, the enjoyment of the after part of the evening was enhanced by music and recitations.

ASHENHURST FUND.

The case of Mrs. Ashenhurst has been before the notice of the Profession since June last, and in August, page 382, we appealed in her behalf, and gave an account of her deceased husband—a Dentist's assistant. As a result of the united eloquence of the two Dental

Journals with the largest circulation there have been received subscriptions as stated in the subjoined list, a total amount considerably less than had been anticipated. Those who have not already subscribed are urged to at once send in their remittances, or request the Dental Depôts, with whom they do business, to hand over the amount and charge the same to their account. The several Depôts have readily expressed their willingness to do this. The case is a needy one, and worthy of the charitable consideration of the Dental Profession.

	£	s.	d.		£	s.	d.
Edwin Saunders	2	2	0	Edwin Goodman	0	5	0
R. T. Freeman	1	1	0	W. H. Shears	0	5	0
J. S. Crapper	1	1	0	J. W. L.	0	5	0
Messrs. Gabriel	1	1	0	Per G. W.	0	3	0
Joseph Walker	1	1	0	J. Cohen	0	2	6
A. G. Levason	1	1	0	F. J. H.	0	2	6
Mr. Dunn	1	1	0	T. M.	0	2	6
J. S. Slipper	1	1	0	M. W.	0	2	6
Edward Bartlett	1	1	0	P. H.	0	2	6
H. François	0	10	6	E. Williams	0	2	0
G. Frost	0	10	6	The Friend of an Assistant	0	1	6
J. Hayes	0	10	6	Per Mr. Dunn :—			
J. Stirling	0	10	6	Sig. Catalini	0	1	0
J. C. Tippett	0	10	6	Sig. Rocchi	0	1	0
G. Weaver	0	10	6	Sig. Fatti	0	1	0
J. J. W. & A. E. B.	0	10	0	Mr. Goff	0	1	0
Per A. G. Levason	0	9	6	Mr. Wheelock	0	1	0
Messrs. Osborne & White's Assistants	0	8	6	J. H. J.	0	1	0
G. Beavis	0	5	0	R. E. W.	0	1	0
				Mr. Watson	0	1	0

Per Messrs. Ash & Son :—

	£	s.	d.		£	s.	d.
Messrs. Ash & Son	2	2	0	W. H. Nicol	0	10	6
Memo	1	1	0	W. H. Griffiths	0	10	6
M. P.	0	15	0	A Dentist's Pupil	0	5	0
Messrs. Henry & Son	0	10	6	A. B.	0	1	0

Per The Dental Manufacturing Company :—

	£	s.	d.		£	s.	d.
F. J. Vanderpant	1	1	0	W. H. B. N.	0	5	0
J.	1	1	0	B. C.	0	5	0
Dr. Elliott	1	0	0	H. H. G.	0	5	0
A. J. W.	1	0	0	R. C.	0	5	0
W. H. W.	1	0	0	J. L. L.	0	5	0
R. H. W.	1	0	0	A. Pitowsky	0	5	0
L. R.	0	10	6	W. Bates	0	5	0
J. F.	0	10	6	C. S.	0	5	0
S. B.	0	10	6	A Friend	0	3	0
A. C.	0	10	0	D. D. H.	0	3	0
J. R.	0	10	0	J. C.	0	3	0
W. B. B.	0	10	0	R. H.	0	2	6
G. Brunton	0	10	0	D.	0	2	6
W. Campbell	0	10	0	B. P.	0	2	6
W. T.	0	10	0	J. C. Y.	0	2	6
J. L.	0	7	6	G. H.	0	2	6
G. D.	0	6	0	E. H. W.	0	2	6
C. Smith	0	5	0	G. O. W.	0	2	6
S. G. Y.	0	5	0	C. S. L.	0	2	6

Per The Dental Manufacturing Company (*continued*):—

	£	s.	d.
D. A. W.	0	2	6
G. W. P.	0	2	6
G. C.	0	2	6
F. W.	0	2	6
H. S.	0	2	6
Prossen	0	2	6
W. W.	0	2	6
A. J. B.	0	2	6
G. H. J.	0	2	6
R.	0	2	0
F. C. R.	0	2	0
E. M.	0	2	0
H. B.	0	2	0
E. P.	0	2	0
J. P.	0	2	0
T. G.	0	2	0
W. P.	0	1	0
H.	0	1	0
J. L.	0	1	0
E. G.	0	1	0
R. K.	0	1	0
T.	0	1	0
S.	0	1	0
E. F.	0	1	0
A. W. H.	0	1	0
A. C.	0	1	0
F. H.	0	1	0
J. J. H.	0	1	0
J. G.	0	1	0
J. H.	0	1	0
W. Yeates	0	1	0
J. A. R.	0	1	0
W.	0	1	0
E.	0	1	0
A. B. T.	0	1	0

Per Dental Manufacturing Company's Employés.—

	s.	d.
R. A. W.	5	0
R. B.	5	0
R. S.	5	0
J. S.	2	6
J. M.	2	6
W. A.	2	6
J. C.	1	0
P. C. J.	1	0
T. M.	1	0
M. S.	1	0
T. A. B.	1	0
C. D.	1	0
T. P.	1	0
H. A. E.	1	0
W. H.	1	0
A. B. C.	0	6
P. R.	0	6
H. B. S.	0	6

OBITUARY NOTICES.

Alfred George Canton, M.R.C.S., L.D.S.Eng., who died October 30th, at the age of 67, was a man much respected in the Profession. He took an active part in the formation of the Odontological Society, and held several offices in the early career of the Society. His practice in Great Marlborough Street is carried on by his son, Mr. Frederick Canton.

Thomas Clements, L.D.S.Eng., Colvill Road, W., died very suddenly in October last. He had not long enjoyed the membership of the Odontological Society, and was a hard working and respected practitioner.

Frank Ebbets, L.D.S.Eng., Margaret Street, W., was recently the victim of enteric fever.

ERRATUM.

By some unaccountable error the Royal College of Surgeons of Edinburgh was, at page 523, accredited with having recently admitted as Licentiates in Dental Surgery the list of Students from the London and the National Dental Hospitals. The paragraph should have been headed "Royal College of Surgeons of England."

Editorial.

THE CAREER OF THE "DENTAL RECORD."

This number of the Dental Record completes the second volume and signalises its age as a year and a half. A retrospect of the principal contents of the Dental Record during that short period will compare favourably with the prefatory introduction given at its birth.

It has been the aim of the Editor to sink personal views on matters politic, or otherwise; and while the Editorial Articles have been short, their subject matters have been dealt with, for the most part, in a spirit of broad generalisation. At the same time a subjective vein, rather than objective dominance, has not been lost sight of.

The support accorded in the form of original articles, we venture to say, has been satistactory, both as regards number, subjects, and quality; and many of them have their value and interest added to by being illustrated. In many instances have selected articles been published along with, and had a bearing upon, the subject of an original communication. In that way have different phases of one question followed upon one another, and the reader has been provided with several aspects of the same topic, or with varied experiences and modes of practice. The importance of the question of the relation of micro-organisms to inflammation and suppuration, has been fully recognised; and from time to time have Articles dealing with the subject been reproduced, epitomised, or noticed. In the October number, for example, there were three articles dealing more or less directly with the treatment of exposed pulp—one of the foundation stones of Conservative Dental Surgery. And in the succeeding number the therapeutic use of certain reputed antiseptic and disinfectant or germicidal agents received attention, and the experience and opinions of several practitioners were recorded. It is purposed that an account of the natural history of those fungi shall shortly appear in these pages, and thus will the readers of the Dental Record have been placed in possession of the most recent and complete investigations respecting the relation of these lowly, yet subtle and insiduous beings, the presence and effects of which have so signally baffled the efforts of some of those who extol the principles of conservative treatment. It is with a consciousness of the cardinal importance of those principles being recognised and acted upon by Dentists, to the elevation of Dental Surgery and its more full attainment to the position of a subscience of Medicine, that the subject of fungoid septicity is receiving so much attention in our pages.

The all-absorbing subject of Filling Teeth has received consideration commensurate with its significance. Eighteen articles relating to the subject, each article being of a very practical nature, and the majority of them original communications, have appeared in the pages of the DENTAL RECORD.

The Replantation of Teeth is another topic that has been dealt with in five articles, including the specially illustrated and valuable Paper by Dr. Finley Thompson.

Though on one string many tunes may be played, and this expression is exemplified in the instances just cited, yet there have been several other subjects dealt with in that serial order, to the production of a variation that has called forth many expressions indicative of the harmony being appreciated and satisfactory.

For the assistance that the numerous contributors have given us in the past we are extremely grateful, and as an indication of the sincerity of that gratitude, we beg them continue to help us in the future. While the members of the Profession support us with their literary contributions, correspondence, and other items of news, we shall maintain our efforts to produce a really good Dental Journal.

GOSSIP,

AT the fourteenth annual session of the Southern Dental Association Dr. W. G. A Bonwill spoke of the discovery made by him of "Analgesia," as contradistinguished from anæsthesia, in that it consists simply in absence of pain, but not of ordinary sensibility. He said that he discovered some years ago that rapid breathing for the space of a minute or less, at the rate of one hundred inspirations to the minute, would produce a condition of absolute absence of pain, lasting a number of seconds, and that surgical operations could be performed quite as well in this way as with anæsthetics. When he first announced this discovery it was ridiculed, but of late he had been told by an eminent professor of physiology that the discovery was based on sound physiological principles. He earnestly urged those present to experiment for themselves as to the truth of the theory.

The following eleven commandments are the headings of an editorial article on "How Dentists may be Healthy," in *Items of Interest*:—

FIRST: Do not over work.

SECOND: Keep cool.

THIRD: Be cheerful.

FOURTH: Stand upright.

FIFTH: Stand at the chair so as not to inhale the breath of your patient.

SIXTH: See that your office is well ventilated, is at a healthy temperature, and is free from the virus of putrid blood, and other unwholesome odors.

SEVENTH: Do not spend too many hours in your office.

EIGHTH: Be something else than a Dentist.

NINTH: Avoid pernicious habits.

TENTH: Be simple, plain, and reasonable in your eating and drinking.

ELEVENTH: Acquire habits of regularity and method.

FEW, if any better societies than the Ohio State Dental Society exist. No dentist in the State, says the *Ohio State Journal of Dental Science*, can afford to miss one of its meetings for ten times the money that he can earn by staying at home, added to the expenses incurred by attending. There may have been a time when the people could appreciate a stay-at-home dentist, but in these days of enlightenment the better class of them feel sorry at the idea of disturbing him in his contentment, so they let him stay at home, and they wait for the return of his rival from the Society meeting to get their work done, feeling sure that this is the way to get operations according to the latest and best improvements.

MR. W. C. BARRETT, M.D., D.D.S., in a Paper read before the American Dental Association in August last, wrote:—"We have all known persons whose hair during conditions of nervous excitement would stand on end, and from whom at such times could be drawn distinct electric shocks. I know a man who, by inducing a restless, agitated, nervous state, in favourable atmospheric condition, can light a gas jet by simply holding his finger tip to the burner. These states are always succeeded by nervous depression, undoubtedly due to a loss of nervous power, through its transmutation into electrical force."

THE annual dinner of the past and present students of the Dental Hospital of London will be held on Saturday, December 2nd, at the Freemasons' Tavern, Great Queen Street, W.C. James Parkinson, Esq., in the chair.

A QUARTERLY meeting of the directors of the Society for the Relief of Widows and Orphans of Medical Men was held on October 11th. The chair was taken by the President, Sir George Burrows, Bart. Two new members were elected. Applications for grants were received from sixty-one widows, five orphans, and three orphans on the Copeland Fund, and it was resolved that a sum of £1,259 10*s*. be recommended for distribution at the next quarterly meeting. The quarterly expenses amounted to £34 17*s*.

AN election of examiners, to examine candidates for the Dental Diploma of the Royal College of Surgeons in Ireland, was held on the 5th of October. The three outgoing examiners, being Fellows of the College—Messrs. Richardson, E. Stoker, and O'Grady—were re-elected. The Dentists elected were Mr. R. Theodore Stack, Mr. Daniel Corbet, jun., and Mr. Henry G. Sherlock. The latter gentleman was re-elected a member of the Court of Examiners. Mr. Stack and Mr. Corbet are new members.

AN American advertisement runs as follows:—Wanted, Mechanical Dentist, must be a pratical man, competent to work *Gold, Platina, Celluloid, etc.* Students, and recent graduates need not reply, as theory, Cicero, and Homer will not do. I want a *Pratical Mechanical Dentist,* with common sense, and no appendages affixed to his name, *that knows how to work.*

DURING the October sittings of the Examiners of the Royal College of Surgeons, Edinburgh, Mr. William Thomas Elliott, Diss, passed his first professional examination for the License in Dental Surgery; and Messrs. Joseph Smithson and Thompson, Dublin; Henry Blandy, Chesterfield; and Hume Purdie, Alford, passed their final examination and were admitted L.D.S.

FOR the detection of lead in tinfoil, a drop of concentrated acetic acid is let fall upon the suspected leaf, and a drop of solution of potassium iodide is added. If there is lead present there is formed in two or three minutes a yellowish spot of lead iodide. Kopp moistens the leaf to be examined with sulphuric acid. If the tin is pure the spot remains white, but if lead is present there is formed a black spot.

J. E. RICHARDSON, L.D.S.I., has been appointed Honorary Dental Surgeon to the Derby Amalgamated Friendly Societies Medical Association.

WHILE a connection between the state of the sun's surface as regards spots and the magnetic state of the earth may be considered as well established, the fact of a connection between sunspots and terrestrial meteorology is still *sub judice.* Professor Balfour Stewart says that there is a maximum of river height about the time of maximum sunspots, and another subsidiary maximum about the time of minimum sunspots. The Nile agrees with the European rivers in exhibiting a maximum about the times of maximum sunspots and a subsidiary maximum about the time of minimum sunspots, only the subsidiary maximum is greater than for the Elbe and the Seine.

THE Romany Amateur Dramatic Club will give a performance in St. George's Hall, Langham Place, W., on Tuesday, the 19th inst., in aid of the funds of the Dental Hospital of London. To commence at 8 o'clock with the comedy, in three acts, by Messrs. Palgrave Simpson and Herman Merivale, entitled "Alone," and conclude with the eccentricity, in three acts, by W. S. Gilbert, Esq., "The Wedding March."

EUCALYPTUS Oil is not, according to Dr. G. v. Schleinitz, of Arnsberg, a powerful aseptic or antiseptic; and according to Koch's experiments a solution must be at least of the strength of seven per cent. to destroy germs, although a one per cent. solution will prevent their growth.

THE Board of Examiners in Dental Surgery of the Royal College of Surgeons of England held three meetings during the past collegiate year, and examined 32 candidates, 28 of whom were approved.

Communications.

Communications have been received from W. R. Humby, London; C. S. Biltcliffe, Dewsbury; David Bogue, London; J. S. Amoore, Edinburgh; Walter H. Coffin, London; W. St. George Elliott, London; Secretary College of Surgeons, Edinburgh; Matthew Leeming, Manchester; J. B. Holloway, London; The House Surgeon of the London and of the National Dental Hospitals; J. R. Brownlie, Glasgow.

Books, &c., Received.

"Dental Metallurgy," Essig; "Nervous Force," W. C. Barrett, M.D.; "Transactions of Odonto-Chirurgical Society;" "British Journal of Dental Science;" "Journal of British Dental Association;" "Dental Cosmos;" "Dental Advertiser;" "Dental Register;" "Items of Interest;" "Missouri Dental Journal;" "Ohio State Journal;" "American Journal of Dental Science;" "The Southern Dental Journal;" "The New England Journal of Dentistry;" "Chemist and Druggist;" "Sanitary Record;" "Revue Odontologique;" "Le Progrès Dentaire;" "L'Odontologie;" "Zahntechnische Reform;" "El Progresso Dental."

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